

US EPA ARCHIVE DOCUMENT

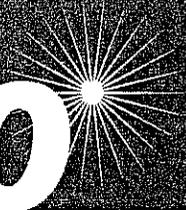
Comments on R. M. Schahfer Power Station

EPA:

Clarify whether hazard potential rating is low or less than low. There is a discrepancy between the report body, the first page of the checklist, and the third page of the checklist for the Retention Pond.

State: None

Company: **See attached letter and supporting documents dated August 11, 2010.**



August 11, 2010

Via E-mail and U.S. Mail

Mr. Stephen Hoffman
US Environmental Protection Agency (5304P)
1200 Pennsylvania Avenue, NW
Washington, DC 20460
hoffman.stephen@epa.gov

Dear Mr. Hoffman:

Northern Indiana Public Service Company ("NIPSCO") appreciates the opportunity to submit these comments ("Comments") to the Camp, Dresser, and McKee Inc ("CDM") draft "Assessment of Dam Safety of Coal Combustion Surface Impoundments - R.M. Schahfer Generating Station" (the "Draft CDM Report"), which NIPSCO received via email on July 12, 2010. To aid in its evaluation of the Draft CDM Report, NIPSCO retained the services of Golder Associates, Inc., ("Golder") a national leader in the field of dam construction and safety. Golder was asked to evaluate important aspects of the Draft CDM Report and to advise NIPSCO of its assessment and professional opinion via a written report. A complete copy of the report ultimately prepared by Golder is attached as Exhibit A (the "Golder Report"). Many of the comments presented below are based upon findings of the Golder Report.

Among its significant conclusions, the Golder Report concludes that all of the R.M. Schahfer Generating Station's (the "RMSGs's") ponds and impoundments ("Units") assessed by CDM are in "fair" or "good" condition based upon criteria Golder believes to be appropriate based upon its experience. The Golder Report also finds that none of the conditions observed "indicated urgent attention was needed" at the time of Golder's inspections. Secondary studies and investigations are, however, suggested over time.

The remainder of Comments are presented in three parts. Part I offers NIPSCO's general comments to some of the more significant aspects of the Draft CDM Report. Part II presents Unit-by-Unit comments and section-specific recommended edits concerning certain factual misstatements within the Draft CDM Report. Finally, Part III states NIPSCO's specific recommendations for revisions to the Draft CDM Report.

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Also attached to these Comments as Exhibit D, pages 7 through the end, are additional documents that may facilitate revision of the Draft CDM Report. NIPSCO asserts that these additional documents are confidential business information and asks that the agency treat them as such.¹ After CDM's inspection and NIPSCO's June 2010 document production, NIPSCO continued to search its files for responsive information. During this search, NIPSCO discovered additional construction quality assurance documentation that should help demonstrate the suitability of the soil used in construction of the Units and the effectiveness of the construction methods. The documentation includes Proctor Tests and field compaction tests performed during the construction of the Retired Waste Disposal Area and the Final Settling Basin.²

Part I: General Comments

1. **Scope of CDM's Assessment:** It is NIPSCO's understanding that the focus of the Environmental Protection Agency's ("EPA's") inspections and, ultimately, its final report would concern only those surface impoundments and management units which receive and are used for the storage and disposal of coal combustion residuals ("CCR"). This understanding was based, in part, upon EPA's March 9, 2009, information request which called for information about the following types of impoundments:

Surface impoundments or similar diked or bermed management unit(s) designated as landfills which receive liquid-borne material from a surface impoundment used for the storage or disposal of residuals or by-products from the combustion of coal, including, but not limited to, fly ash, bottom ash, boiler slag, or flue gas emission control residuals.

In its response to the March 9, 2009 information request, NIPSCO advised EPA that the RMSGS had only four ash management units that met these criteria: the Waste Disposal Area, the Material Storage Runoff Basin, the Metal Cleaning Waste Basin, and the Yard Drain Stormwater Retention Pond. NIPSCO also has two former (and now filled) Units that were formerly used for the disposal of CCR residuals: the Dry Ash Storage Staging Area and the Retired Waste Disposal Area. Although NIPSCO has other Units at the RMSGS, they function to retain

¹ NIPSCO is providing these subject to the same objections and reservations stated at Exhibit B of NIPSCO's letter to you dated June 14, 2010.

² The timing of the discovery of these additional documents did not allow Golder to incorporate them into the Golder Report.

water or leachate. One of the larger Units identified in the Draft CDM Report, the Intake Settling Basin, never collects CCR of any kind. Other Units receive, at most, only incidental and *de minimus* volumes of CCR.

NIPSCO learned orally, shortly prior to CDM's April site inspection, that the EPA and CDM intended to assess all Units at RMSGS, regardless of whether the Units were intended to, or actually did, receive CCR. This position, however, appears different than that taken by EPA with respect to other utilities. The EPA report on Allegheny Energy's Pleasants Power Station, for example, notes that the consultant did not inspect two basins intended for the management of leachate and stormwater. NIPSCO believes the Allegheny Energy report reflected the appropriate and more limited assessment scope.

2. **State Jurisdiction:** The Draft CDM Report notes that "the IDNR requires new and existing structures to be evaluated under standard design guidelines." (Draft CDM Report Section 3.3) That statement presents an oversimplification of Indiana's regulatory scheme in that it fails to recognize, for example, that the Indiana statute and regulations regarding dam safety apply only to structures that meet one or more of the following criteria:

- Drainage area above the dam of more than 1 square mile;
- Height in excess of 20 feet;
- Impoundment of more than one hundred acre-feet of water.

Indiana Code 14-27-7.5-1. Only four of the Units meet any of these minimum criteria: (1) the Final Settling Basin, (2) the Intake Setting Basin, (3) the Recycle Basin, and the (4) Waste Disposal Area.³ Indiana law also provides that the IDNR is to establish a hazard classification for each dam meeting one of these three criteria. Indiana Code 14-27-7.5-8. In late 2009, NIPSCO retained Golder to work with the Indiana Department of Natural Resources ("IDNR") to facilitate the development of hazard potential classifications for the four Units potentially subject to regulation under Indiana's dam safety laws.

As EPA is aware, Indiana's requirements for evaluating dams meeting one of the above-stated criteria differ depending on the hazard potential classification determined by the IDNR. Owners of high-hazard structures are required to have

³ None of the Units meet the criteria for regulation under federal dam safety laws.

those facilities inspected every two years by a professional engineer.⁴ Indiana Code 14-27-7.5-9. Indiana law does not impose an inspection requirement for low and significant hazard facilities.

3. **Draft CDM Report Recommendations:** It is our understanding, based upon an April 2010 conversation between Greg Costakis of NIPSCO and Craig Dufficy of EPA, that the EPA is not now seeking substantive comments to the Draft CDM Report's recommendations for future actions and that these Comments thus need not substantively address the same. To affirm that understanding, we reviewed materials posted on EPA's website and noted that other utilities submitted Response/Action Plans after the completion of the EPA's Final Reports for their facilities. Although NIPSCO is not substantively addressing the Draft CDM Report's recommendations for future activities within these Comments, Part II of these Comments do offer recommended text clarifications. NIPSCO hopes to later work with EPA to develop and implement the appropriate response plan and has provided clarifying text suggestions with Part II below.

4. **Prior and Ongoing Unit Inspections:** The Draft CDM Report does not provide a full or accurate description of NIPSCO's inspection programs. Among other deficiencies, the Draft CDM Report fails to mention a formal dam inspection program that NIPSCO initiated in late 2009 and which was referenced in NIPSCO's response to EPA's March 9, 2009 information request. That inspection was performed by Golder to meet Indiana standards. By the time of CDM's site visit, Golder had already visually inspected and assessed the structural integrity of all the RMSGS Units potentially regulated under Indiana's dam safety laws. After it became clear during the course of CDM's site inspection that it intended to assess the structural integrity of all Units, including those which receive either no or only incidental volumes of CCR (*see* Comment 2 above), Golder's evaluation was expanded to include the additional Units.

While Golder's written report regarding its structural integrity assessment was not available at the time of CDM's inspection, NIPSCO did notify EPA and CDM of Golder's continuing work. Golder's structural integrity findings are, however, apparent from the Golder Report.

⁴ Such an inspection has been performed this year for each of the four Units potentially regulated under Indiana's dam safety laws.

In preparing the Golder Report, Golder followed the detailed standards and procedures set forth in the Indiana Dam Safety Inspection Checklist. The Draft CDM Report faults NIPSCO for failing to create its own procedures for dam inspections, but it is unclear to NIPSCO why CDM somehow views the procedures painstakingly detailed in the Indiana guidance to be inadequate.

5. **Construction and Design Documentation:** The Draft CDM Report purports to assess the structural integrity of the Units by using criteria modeled from those developed by New Jersey. With those criteria in mind, the Draft Report appears to collectively classify all of the Units as “poor” due to a perceived “lack of documentation relative to the design and construction” of the Units. (Draft CDM Report Section 4.2.) NIPSCO strongly disagrees with that conclusion and suggests that sufficient documentation exists to reasonably assess the Units. The Golder Report supports NIPSCO’s position.

The Draft CDM Report also states that “CDM was not provided with any information regarding the structural adequacy and stability of the R.M. Generating Station ash ponds” (Draft CDM Report Section 3.3.1). That statement is simply inaccurate. Substantial information regarding the structural integrity of the Units was, in fact, made available to CDM. CDM seems to at least indirectly acknowledge its receipt of structural information at Section 6 of the Draft CDM Report by stating a list of forty-one “drawings that were provided by Northern Indiana Public Service Company and were utilized during the preparation of this report and the development of the recommendations presented”. CDM’s list, however, fails to comprehensively delineate all the documents NIPSCO copied and sent to CDM at its request. Moreover, CDM’s list fails to in any way acknowledge the many other documents made available to CDM during its site inspection and which may have been useful to CDM in assessing the condition of the Units. In total, at CDM’s request, NIPSCO copied and delivered to CDM over 2,400 pages of design documents. This included “as-built” drawings for the Waste Disposal Area, soil information on the Intake Settling Basin and Retired Waste Disposal Area and both drawings and specifications sealed by professional engineers for all current and retired Units. As stated in the Golder Report, the various certifications by registered Indiana professional engineers helps demonstrate that the Units were designed and constructed to sound engineering standards.

6. **Unit Classifications:** NIPSCO is concerned that the Draft CDM Report creates a significantly inaccurate impression by attempting to assign a collective single classification to nine different Units at RMSGS without considering critical

differences in the condition, regulatory status, and purpose of each of the nine Units. From an engineering perspective, the structural integrity of one Unit certainly cannot, and should not, be determined based upon another Unit. Each Unit should be assessed and classified independently.

The Golder Report assesses each Unit separately and disagrees in some instances with CDM's visual assessments. As Golder notes, the condition of all of the Units is "fair" or better.⁵ The condition of RMSGS's largest Unit, the Final Settling Basin, is deemed "good" by Golder. Golder also disagrees with CDM's assessment that RMSGS's fourth largest Unit, the Intake Settling Basin, is a "high hazard" facility. After performing detailed analyses using the Army Corps of Engineers Hydrologic Engineering Center's River Analysis System, Golder opines that the Intake Setting Basin is a "low hazard" facility. (*See* Section 4.0 of the Golder Report).

Part II: Unit and Section-Specific Comments:

To further assist the EPA in tracking NIPSCO's comments, NIPSCO has prepared (a) the below Unit-by-Unit listing of NIPSCO's concerns statements offered in the Draft CDM Report with respect to each of the Units and (b) the attached Exhibit B and Exhibit C which present specific text corrections to certain sections of the Draft CDM Report.

- Final Setting Basin (FSB): As discussed above, the Final Settling Basin (FSB) is not a Unit designed for the management of CCR. At most, the FSB has received only *de minimus* quantities of CCR. In addition, the Golder Report notes that the condition of the FSB is "good." The Draft CDM Report, as written, appears to convey the erroneous conclusion that the FSB is instead in "poor" condition. NIPSCO is particularly concerned about inaccurate or imprecise information regarding the FSB because the FSB appears to be considered to have a high hazard potential.

⁵ Importantly, the Golder Report notes that the definition of "fair" used by Golder is effectively identical to that used by the Draft CDM Report.

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- Intake Setting Basin (ISB): Like the FSB, the ISB is not a Unit designed for the management of CCR. In fact, the structure never receives any CCR.⁶ Golder also performed a detailed hazard potential classification of this Unit and concluded that its hazard potential classification is “low,” and not “high,” as suggested in the Draft CDM Report.
- Yard Drain Stormwater Retention Pond (inaccurately called the “Retention Pond” in the Draft CDM Report): This Unit is too small to be regulated by Indiana’s statute and regulations concerning dam safety. In addition, the condition of this concrete-lined Unit was determined by Golder to be in “good” condition.
- FGD Stormwater Runoff Pond (FGD Pond): As discussed above, the FGD Pond is not a Unit designed for the management of CCR. The FGD Pond receives only *de minimus* quantities of CCR by serving as a stormwater catchment basin for flow from the closed sections of the adjacent FGD/ash landfill. In addition the Unit is too small to be regulated by Indiana’s statute and regulations concerning dam safety.
- Retired Waste Disposal Area: This former, and now filled, Unit is no longer an impoundment or pond and accordingly, is not subject to regulation under dam safety laws. Moreover, even if it this former Unit was somehow deemed to an impoundment or pond, it would likely be far too small to be regulated under Indiana’s statute and regulations concerning dam safety.
- Material Storage Runoff Basin: This Unit is too small to be regulated under Indiana’s statute and regulations concerning dam safety.
- Metal Cleaning Waste Basin: This Unit is too small to be regulated under Indiana’s statute and regulations concerning dam safety.

⁶ The discharge from the FSB (permitted as Outfall 001 in the RMSGS’s NPDES permit) can be recycled to the ISB for use in facility cooling water processes. This capability was developed in response to seasonal low levels in the Kankakee River but has not been used for several years.

- Recycle Basin: The Recycle Basin is not a Unit designed for the management of CCR. The Unit receives only *de minimus* quantities of CCR by receiving clarified overflow from the Waste Disposal Area, into which the facility's bottom ash, boiler slag and economizer ash from a single unit are sluiced.

Part III: NIPSCO Requests and Recommendations:

NIPSCO requests that the EPA make the following amendments to the Draft CDM Report:

- Assess each of the Units separately, considering Golder's visual assessments as well as those of CDM. Acknowledge particularly Golder's conclusions that the ISB is a "low-hazard" Unit, that the condition of the FSB is "good," and that the condition of all of the Units is "good" to "fair." The Draft CDM Report should further note that Golder did not believe that the condition of any of the Units was poor.
- Limit the discussion to those Units at RMSGS which are designed to handle CCR: the Waste Disposal Area, the Material Storage Runoff Basin, the Metal Cleaning Waste Basin, and the Yard Drain Stormwater Retention Pond. At a minimum, remove the ISB from the Draft CDM Report because it does not receive even *de minimus* quantities of CCR.
- Present a more thorough and accurate description of Indiana dam safety law and state that NIPSCO is reportedly working with the IDNR to accomplish any activities required by Indiana law. Note that only four of the Units analyzed, the FSB, the ISB, the Recycle Basin, and the Waste Disposal Area (only one of which, the Waste Disposal Area, is even designed to receive CCR) are large enough to be potentially regulated under Indiana's laws concerning dam safety.
- Re-evaluate the 2,400 pages of documents provided by NIPSCO, paying particular attention to the assessments of soil conditions, and the drawings bearing the seal of a Professional Engineer. The re-evaluation should consider Golder's professional opinion and conclusion that the sealed drawings help demonstrate that the Units were designed and constructed using sound engineering practices.

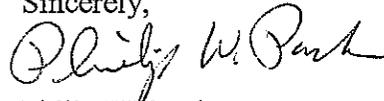
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- Acknowledge that NIPSCO had inspections by Professional Engineers already underway by the time of EPA and CDM's inspection. To the extent that CDM believes that the Indiana procedures followed by Golder were somehow inadequate, explain the inadequacies of those procedures.
- Incorporate the edits recommended above and reflected on the attached Exhibit B and Exhibit C

* * * * *

Thank you again for this opportunity to comment to the Draft CDM Report. While we endeavored to be comprehensive with these Comments, the allotted review period precluded us from doing so. Instead, these Comments focus on issues that may be of most immediate significance. Accordingly, the lack of a comment to a specific section or statement of the Draft CDM Report should not be taken to indicate NIPSCO's agreement. Please call or email Gregory Costakis, gcostakis@nisource.com or 219-956-5125, with any questions.

Sincerely,



Philip W. Pack

Senior Vice President, Generation Interim

EXHIBIT "A"



August 11, 2010

093-88638

Mr. Greg Costakis
Northern Indiana Public Service Company
2723 East 1500 North
Wheatfield, IN 46392

**RE: INSPECTION REPORT AND ASSESSMENT OF CDM REPORT
R.M. SCHAHFER GENERATING STATION, WHEATFIELD, INDIANA**

Dear Mr. Costakis:

Golder Associates Inc. (Golder) is pleased to provide this letter report to Northern Indiana Public Service Company (NIPSCO) summarizing observations of selected basins or ponds (collectively referred to as structures in this letter report) at NIPSCO's R. M. Schahfer Generating Station located near Wheatfield, Indiana. Golder's inspections were conducted on March 30, 31 and April 1, and July 7, 2010. Weather conditions were moderate temperatures and mostly sunny skies during the spring visit, and mostly sunny and hot during the early July visit. Observations were made by Mark Funkhouser and Mark Haddock in the spring, and by Mark Funkhouser and Tom Stanko in July.

This letter report is intended to respond to certain technical findings of the draft report prepared by CDM for the U.S. Environmental Protection Agency titled "Assessment of Dam Safety of Coal Combustion Surface impoundments, Northern Indiana Public Service Company, R. M. Schahfer Generating Station, dated July 12, 2010. It is not intended to comprehensively address all the findings in the draft CDM report. This report does not include recommendations.

None of the structures inspected were found to be in poor condition. The condition of the structures inspected was found to be fair or better. Our assessments are based on our visual observations on the dates of our field visits and on review of Sargent and Lundy drawings provided by NIPSCO.

In the draft CDM report and in this letter report, there are also references to "hazard ratings". It is important to note that hazard ratings do not in any way address the probability or likelihood of failure. These ratings relate to the consequences of a failure if it were to occur, i.e., assuming a failure, what might be the result. A low hazard structure has a lower consequence of failure than a high hazard structure. The likelihood of failure for each of these structures can be the same or different.

1.0 GOLDER ASSOCIATES COMPANY BACKGROUND

Golder Associates' inspections were primarily lead and conducted by Mr. Mark Funkhouser, P.E. and Mr. Mark Haddock, P.E., both licensed professional engineers with Golder. Mr. Funkhouser is a geotechnical engineer with 23 years of experience in geotechnical and rock mechanics issues for various clients and market sectors. Mr. Haddock is a geological/geotechnical engineer with more than 16 years of experience. Mr. Haddock has an extensive background in dam and reservoir construction/repair experience.

Golder has been responsible for the design, construction management, and inspection of several hundred new and existing dams and reservoirs. These structures have been built for water supply, irrigation, mine tailings, ash disposal, flood control, hydroelectric power, environmental enhancement, recreation and fish breeding. Our experience extends from siting to investigations, permitting, numerous aspects of detailed design, construction management, and post-construction monitoring. Specific services have included:

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planning, scoping and design of new structures; design of expansions and rehabilitation; development of operations plans, development of maintenance plans, inspections; and development of instrumentation and monitoring plans.

Golder conducts numerous dam inspections annually. These inspections are performed in accordance with applicable state and federal regulations and guidelines. These inspections require detailed assessments of the various components of hydraulic structures many of which are similar to the structures at NIPSCO's R. M. Schahfer Generating Station.

Also of relevance is Golder's familiarity with developing operating and maintenance (O&M) plans for the long-term operation of earthfill dams and appurtenant structures, as required by regulatory agencies. Golder has prepared numerous O&M Plans and Emergency Action Plans (EAPs) for many of the same structures designed or reviewed in some other capacity.

2.0 FACILITY BACKGROUND

The R. M. Schahfer Generating Station is a coal-fired power generating facility located near Wheatfield, Indiana. Various active and retired water and ash storage structures exist at the facility. Table 1 summarizes the physical characteristics, material storage capacity, and management practices of nine of the structures.

3.0 OBSERVATIONS AND ASSESSMENTS

To the extent practical, Golder has used words such as "adequate", "dense" and "sparse" in this report, as these words are used in the State of Indiana's "Dam Safety Inspection Checklist", which was the form used to document observed conditions during Golder's site visits.

Golder's use of the words "good", "fair", and "poor" in this document may not necessarily be the same as used by others even in similar context. The following definitions are considered appropriate, and in this document the words are used as follows:

- Poor: Dam safety concerns call for immediate action.
- Fair: No immediate dam safety concerns observed, but engineering and repair or maintenance is required.
- Good: No dam safety concerns observed, but continued monitoring and routine maintenance is recommended.

In the draft report prepared by CDM, the terms "Poor", "Fair", and "Good" are used to describe the condition of individual impoundment components, and also the overall condition of the facility impoundments as a group. Golder understands that the use of these words in the referenced report is based on the following definitions:

- Poor: A dam safety deficiency is recognized for any required loading condition (static, hydrologic, seismic) in accordance with the applicable dam safety regulatory criteria. Remedial action is necessary. Poor also applies when further critical studies or investigations are needed to identify any potential dam safety deficiencies.
- Fair: Acceptable performance is expected under all required loading conditions (static, hydrologic, seismic) in accordance with the applicable dam safety regulatory criteria. Minor deficiencies may exist that require remedial action and/or secondary studies or investigations.
- Satisfactory (assumed equivalent to "Good"): No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all applicable loading conditions (static, hydrologic, seismic) in accordance with the applicable regulatory criteria. Minor maintenance items may be required.

These two sets of definitions have not been consolidated in this report. However, Golder has made a comparative assessment for each of the three categories as follows. The Golder and CDM definitions of

"poor" deviate in that Golder's definition of "poor" focuses on observed conditions that are significant and urgent, while the CDM definition focuses more on loading conditions but also indicates "remedial action is necessary". The two definitions of "fair" are considered to be effectively equivalent in this report context. The definitions of "good" (or "satisfactory") are similar, but again the Golder definition focuses on observed conditions while the CDM definition refers to loading conditions. The fact that actual analyses are not available is a concern, but this concern is alleviated in part by the fact that 79 construction drawings, most of which are signed and sealed by a professional engineer licensed in the State of Indiana, are available. These drawings show many of the facilities' details.

Observations of the upstream slope, crest, downstream slope (where applicable), outlet structure (where visible), and emergency spillway (where applicable) for the Final Settling Basin and the Yard Drain Stormwater Retention Pond are summarized below. These two structures were assessed by Golder to be in good condition, but were assessed to be in fair condition (Section 4.2 of the referenced draft report) by CDM. Also included in this section are overview descriptions of these two structures. These overview descriptions are based largely on information provided by NIPSCO and are supported to some degree by field observations.

It is noteworthy that a relatively consistent deviation between Golder's condition assessment and CDM's condition assessment of the upstream (interior) slope exists. Golder assessed the upstream (interior) slopes of the structures inspected to be typically in good condition with some fair assessments, while CDM typically assessed the interior (upstream) slopes of the structures inspected to be in poor condition with some fair assessments. The reason for the condition assessments was not made clear in the draft CDM report, and this deviation could not be reconciled. Golder's field notes and photographs show most upstream (interior) slopes need spot rip rap repair and brush removal, which Golder considers to be minor repair and/or maintenance.

Summaries of observations for all of the structures inspected are not provided in this letter report. Information on the structures (the Intake Settling Basin, the FGD Runoff Pond, the Retired WDA (retired 1982), the Material Storage Runoff Basin, the Metal Cleaning Waste Basin, the Waste Disposal Area, and the Recycle Basin) where Golder made observations and assessments, which are not included here are available from NIPSCO upon request. The following sections describe two structures where Golder's condition assessment differs from CDM's.

3.1 Final Settling Basin

The Final Settling Basin receives sanitary wastewater from the facility, cooling tower blowdown, and discharge water pumped from the Material Storage Runoff Basin, the Metal Cleaning Waste Basin and the Recycle Basin. The Final Settling Basin discharges on an intermittent basis from a pump station to the Kankakee River via pipelines. The Final Settling Basin can also discharge by pumps and pipes to the Intake Settling Basin for reuse in plant cooling processes. A spillway discharges to an open channel that connects with Davis Ditch.

Available drawings indicate the Final Settling Basin embankment is approximately 12,000 feet long with a 15.5-foot wide crest, and 3 horizontal to 1 vertical (3H:1V) side slopes. The crest of the embankment is shown at elevation 677 ft-msl, and surrounding ground at approximately elevation 664 ft-msl.

Visual observations indicate the overall condition of the Final Settling Basin is good. Commentary and condition of individual components are provided below.

Upstream slope: Minor local loss of riprap at reentrant corners and at isolated locations on the east slope. Isolated locations of sparse vegetation; very minimal erosion - thinned riprap; no instabilities were apparent at the time of inspection. The overall condition of the upstream slope is good.

Crest: Compacted gravel/cinders on the surface; straight and level to the eye; no trees, brush or ground cover, no erosion or instabilities or rodent burrows were apparent at the time of inspection. The overall condition of the crest is good.

Downstream slope: Few trees and sparse brush; notable willow stands in the north part of the east slope and north central part of the west slope, good grass on the east and north slopes, adequate to sparse grass cover elsewhere. Some runoff erosion from crest. Two areas of wetness, but no seepage observed. Surficial slumping – possible solifluction or frost creep on west and southwest slopes.

Emergency Spillway: Good condition – note stop log has been installed in spillway to raise water level and increase storage.

Outlet Structure: Pump house at north west corner; good condition where visible.

3.2 Yard Drain Stormwater Retention Pond

The Yard Drain Stormwater Retention Pond receives yard runoff from fly ash and gypsum handling areas. Water in the Yard Drain Stormwater Retention Pond is pumped to the Material Storage Runoff Basin. The Yard Drain Stormwater Retention Pond is an incised structure approximately 1.3 acres in size with a rim elevation of approximately 665 ft-msl.

Visual observations indicate the overall condition of the Yard Drain Stormwater Retention Pond is good. Commentary and condition of individual components are provided below.

Upstream Slope: Concrete, no trees, no brush, no ground cover; no erosion or instabilities were apparent at the time of inspection. The overall condition is good.

Crest: Adequate, no trees, no brush, no ground cover, no erosion or instabilities noted. The overall condition is good.

Downstream Slope: None. This facility is incised.

Outlet structure: Pump house at west side. The condition is good where visible.

Emergency Spillway: None.

4.0 HAZARD CLASSIFICATION

In the draft CDM report, the Intake Settling Basin is described as a high hazard structure. Based on Golder's analysis and as described below, the Intake Settling Basin was considered to be a low hazard structure. Golder completed the hazard classification review according to Indiana State Code 312 IAC 10.5 and the Indiana Department of Natural Resources (IDNR), Division of Water *General Guidelines for New Dams and Improvements to Existing Dams in Indiana* (2001 Edition).

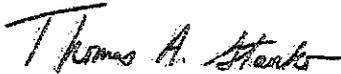
Golder's hazard classification review included conducting a dam breach analysis using the Army Corps of Engineers Hydrologic Engineering Center's River Analysis System (HEC-RAS) Version 4.0 computer modeling program. Breach parameters used in the analysis met the IDNR's guidelines. As discussed with the Indiana Department of Natural Resources, Division of Water, Golder simulated the breaches during a theoretical 10-year return period storm. No significant flooding of buildings above the 10-year floodplain is expected to occur in the event of a breach of the Intake Settling Basin. Further, no roads are expected to be overtopped during this event.

5.0 CONCLUSIONS

Golder considers the structures that were inspected in March/April 2010, and in July 2010 to be in fair or better condition with no observed conditions that indicated urgent attention was needed at the time. Additional information should be developed in cooperation with the Indiana Department of Natural Resources. Some non-urgent repairs and maintenance are needed to various degrees at the structures inspected.

Golder appreciates the opportunity to provide professional services to NIPSCO and looks forward to continuing to work with you on this project. Should you have any questions concerning the content of this letter report, please call the undersigned at 517-482-2262.

GOLDER ASSOCIATES INC.



Thomas A. Stanko
Associate



Mark R. Funkhouser, P.E.
Principal and Senior Practitioner

cc:

Attachments: Table 1

MRF/TAS

TABLES

TABLE 1

NIPSCO R.M. SCHAFFER GENERATING STATION PONDS

Facility/Pond Name	Settling Volume (cu yd)	Area (Acres)	Year	Basin Height (Feet)	Basin Depth (Feet)	Construction Method	Estimated Capacity (cu yd)	Inputs	Estimated CCB (cu yd)
Final Settling Basin (FSB)	214		1976	13.0	14.0	slurry wall	Not Applicable	Cooling tower blowdown Sanitary wastewater Input from MSR and MCW	Not Applicable
Intake Settling Basin (ISB)	29.4		1982	11.0	12.0	slurry wall	Not Applicable	Intake and recycle from FSB	Not Applicable
Yard Drain Stormwater Retention Pond	1.3		1999	Incised	7.5	concrete	Not Applicable	Yard drains-back of plant	Not Applicable
FGD Runoff Pond	4.5		1983	3.0	5.0	compacted soil	Not Applicable	Surface runoff from closed areas of landfill	Not Applicable
Retired WDA (Retired 1982)	50		1976	17.0	18.0	slurry wall	1,470,000 cu yd ¹	Fly/bottom ash sluice	1,470,000 cu yd ¹
Material Storage Runoff Basin	12		1982	4.0	7.0	slurry wall	77,400 cu yd	Coal storage runoff Plant area storm drains FGD sumps	65,000 cu yd
Metal Cleaning Waste Basin	12		1982	4.0	7.0	slurry wall	77,400 cu yd	Deminerizer waste Air heater wash water	64,000 cu yd
Waste Disposal Area (WDA)	75.5		1982	17.0	18.0	slurry wall	1,980,000 cu yd	Boiler room sumps Low volume waste Bottom ash sluice Unit 14 economizer & SCR fly ash	750,000 cu yd
Recycle Basin	30		1982	17.0	18.0	slurry wall	Not Applicable	Overflow from WDA	Not Applicable

¹ Estimated neat line volume to crest based on Sargent & Lundy drawings.

EXHIBIT "B"

Exhibit B

Recommended Edits To Certain Sections of the Draft CDM Report

1. Cover Page: The address of R.M. Schahfer Generating Station (RMSGGS) is 2723 East 1500 North.
2. Section 1, Introduction: Mr. Costakis and Ms. Ortiz-Wiegele are representatives of NIPSCO, not NiSource Inc.
3. Section 1.2.1: Please add "Kankakee" before the word "River".
4. Section 1.4: The RMSGGS is not within the corporate limits of the Town of Wheatfield, Indiana.
5. Section 1.4: Figure 3 does not depict all of the Units at RMSGGS.
6. Section 1.4.1: RMSGGS's original ponds were placed into operation in 1976.
7. Section 1.4.1, paragraph 7: Change the name of the basin from "Metal Cleaning Water Basin" to "Metal Cleaning Waste Basin" throughout.
8. Section 1.4.2: See attached Exhibit C.
9. Section 2.34: Change the word "Overflow" to "Outlet."
10. Section 2.5: Change the word "east" to "west" in the third line.
11. Section 2.5.1: Only the north side of the FGD Landfill Runoff Pond borders the fence. NIPSCO also owns the property outside the fenceline. CDM did not request access to the area outside the fence.
12. Section 2.5.2: Change the term "apparent channel opening" to "inlet to the pond."
13. Section 2.5.4: The valve for the FGD Landfill Runoff Pond's outlet pipe is immediately adjacent to the pond and inside the fence. See comments to Section 2.5.1.
14. Sections 2.6 and 2.7: The Units described in the report as the "Gypsum Storage Areas," are officially called the "Retired Waste Disposal Area." The confusion in nomenclature seems to stem from the fact that Georgia Pacific uses this area to stockpile synthetic gypsum for use in their adjacent wallboard facility. Aerial photographs taken near the end of the useful life of this impoundment demonstrate that it was constructed as a single Unit, not two, Units. The dividing structure and road appear to have been installed as the Unit was retired.
15. Section 2.9.4: Solids move from the Material Storage Runoff Basin and then to the Metal Cleaning Waste Basin, and not the other way around.

16. Section 2.10.4: Change the word "Overflow" to "Outlet."
17. Section 2.11: The proper name of the basin addressed is the "Recycle Basin," and not the "Recycle Settling Basin" or the "Recycling Settling Basin."
18. Section 2.11.4: The structure referenced is in the "southwest," not the "southeast" corner of the Basin and provides inflow to the Recycle Basin only. Due to the design of the structure, flow cannot be routed to the Waste Disposal Area. The function of the structure is not to balance water levels but to provide clarified water to the Recycle Basin for reuse in boiler slag / bottom ash sluicing.
19. Section 2.12: There are a number of monitoring wells installed at RMSGS in areas not inspected by CDM.
20. Section 3.1: This Section states that CDM was not provided with any of the "original NIPSCO design assumptions for the [CCR] impoundments". That statement appears to be inaccurate. Please explain what is meant by the quoted text. In doing so, please consider (among other information) the design assumptions reflected in submittals identified on Exhibit D.
21. Section 3.3.1: This Section states that "CDM was not provided with any information regarding the structural adequacy and stability of the R.M. Generating Station ash ponds" and that could not perform its own stability analysis because "CDM was not provided within any information on the properties of the embankment soils." Those statements are far too broad and inaccurate. A substantial volume of information was provided and made available to CDM concerning the stability of Units at the RMSGS, including soil data. The above-quoted text also misstates the name of the RMSGS.
22. Section 4, Table 4: The Retired Waste Disposal (inaccurately described within Table 4 as Gypsum Storage A and B) is filled and stable. Evidence of stability can be drawn from, among other sources, a long history of vehicular traffic. It is NIPSCO's belief that a breach of the mound of this former Unit would have a negligible effect. The presence of a seep from the former Unit seems to support such a conclusion.
23. Section 4, Table 4: Table 4 states that a breach of the Metal Cleaning Waste Basin will likely result in a draining of both the Metal Cleaning Waste Basin and Material Storage Runoff Basin. The Metal Cleaning Waste Basin embankment has been breached twice, each time resulting in very localized disturbances and no adverse impacts outside of the immediate vicinity. Neither event resulted in a draining of the Material Storage Runoff Basin or Metal Cleaning Basin.

Mr. Stephen Hoffman
August 11, 2010
Page 12

24. Section 4.10: Please correct or explain the reference to the "White River".
25. Section 6: The Draft CDM Report's Section 6 includes only a partial listing of the documents NIPSCO copied and sent to CDM at its request. A full listing of the documents produced is attached as Exhibit D.

EXHIBIT "C"

Ten Units were included as part of the visual assessment at the R.M. Schahfer Generating Station. They include the: Final Settling Basin, Intake Settling Basin, Retention Pond, FGD Landfill Runoff, Gypsum Storage (Units 14 & 15) A, Gypsum Storage (Units 14 & 15)B, Material Storage Runoff Basin, Metal Cleaning Waste Basin, Waste Disposal Area and Recycle Settling Basin. The approximate crest elevations of the embankments and pond areas are shown on Table 1.

Table 1 -

Approximate Pond Low Crest Elevations and Areas	Pond Name	Approximate Low Crest Elevation	Approximate Pond Area (Acres)
	Final Settling Basin	677.0	214
	Intake Settling Basin	675.0	30
	Retention Pond	Not Applicable	1
	FGD Landfill Runoff	663.0	5
	Gypsum Storage (Units 14 & 15)A	681.0	45
	Gypsum Storage (Units 14 & 15)B	681.0	9.5
	Material Storage Runoff Basin	667.0	12
	Metal Cleaning Waste Basin	667.0	12
	Waste Disposal Area	681.0	75
	Recycle Settling Basin	681.0	30

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The FSB is charged with influent flows from a 4-inch-diameter welded steel pipe (sewage treatment pipe), four 18-inch-diameter welded metal pipes (cooling tower blowdown pipes), and one 30-inch-diameter welded metal pipes (originating from the Material Storage Runoff Basin and Metal Cleaning Waste Basin pump house). Water from the FSB is discharged from a Pump Station into the Kankakee River. An 18 foot wide overflow weir, with a crest elevation of approximately El. 674.0 discharges water into a concrete lined channel with an invert at El. 660.0. The channel ties into a drainage ditch which discharges via the Davis Ditch to the Kankakee River. The discharge through the Pump Station of the Final Settling Basin is shown on Figure 9.

The Intake Settling Basin is charged with water pumped from the Kankakee River through a 42-inch-diameter welded steel pipe. The discharge pipe invert is at El. 655.0. Details of the intake structure are shown on Figure 10. Water is discharged through a pump station to the R.M. Schahfer Generating Station which is used as process cooling water. Two (2) 24-inch-diameter Corrugated Metal Pipe (CMP) overflows are located along the north embankment. The elevation of the overflow pipe inverts was not available at the time of the assessment.

The Retention Pond receives site stormwater inflow from two (2) 12-inch-diameter Corrugated HPDE Pipes with approximate inverts at El. 661.5. The outflow of the pond is controlled through the pump station. No construction records of the Retention Pond's outlet/inlet structures were supplied.

The FGD Landfill Runoff Pond is charged with runoff water from the adjacent landfill. Runoff from the capped sections of the landfill is collected in perimeter ditches that feed by gravity into the FGD Landfill Runoff Pond. Runoff from the landfill enters the pond from the southeast corner through a weir constructed in the crest of the earthen embankment. The FGD Landfill Runoff Pond discharges to a branch of the Stahlbaum Ditch through an overflow pipe located along the north embankment. The discharge appears to be controlled with a gate. No construction records of the FGD Landfill Runoff Pond's outlet/inlet structures were supplied.

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The retired Waste Disposal Area has been filled with CCR and had no visible outlet/inlet structures. Based on information reviewed, the outflow for the impoundments was controlled through a pump station along the east embankment, which sluiced water from the impoundments into the Material Storage Runoff Basin and Metal Cleaning Water Basin.

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The Material Storage Runoff Basin is charged with coal storage runoff, yard drain effluent including fly ash and gypsum from the Retention Pond, and material from the FGD process sumps. In-flows are through two (2) 24-inch-diameter CMPs and a 6-inch-diameter welded steel pipe, with inverts of approximately El. 665.4. Water is discharged from the Material Storage Runoff Basin to the Final Settling Basin via pumps located at the northeast corner of the impoundment and also to the Metal Cleaning Waste Basin through an open channel which is approximately 8 feet wide by 3 feet deep and is located near the south end of the divider embankment. The Metal Cleaning Waste Basin is charged with flow from plant sluice pipes carrying demineralizer regenerant waste and air heater wash water and discharges to the Final Settling Basin via pumps located at the northwest corner of the impoundment.

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The Waste Disposal Area is charged with influent flows at the northwest corner of the impoundment by through four (4) 16-inch-diameter and four (4) 10-inch-diameter welded steel pipes, with inverts of approximately El. 680.2. In addition, further sluicing enters the impoundment from one (1) 12-inch-diameter welded steel pipe along the north embankment, just north of the pump station, with an invert at El. 679.1. Water flows from the Waste Disposal Area into the Recycling Basin through a weir located in the east divider embankment. The emergency outlet for the impoundment is two (2) 24-inch-diameter CMP pipes, which discharge into a 5 foot wide, concrete lined channel, in which the pipe invert from interior to exterior slope is El. 663.8 to El. 662.0 respectively.

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The Recycle Basin is charged through water from the Waste Disposal Area, which flows into the Recycle Basin through a weir located on the west embankment (being used as a divider embankment). Stoplogs for the weir are not readily available in case of an emergency. No CCR is directly sluiced into the impoundment, and although CCR can potentially enter the impoundment via Waste Disposal Area weir, there is no evidence of this having occurred at any time in the past. The outlet for the impoundment is via a pump station along the north embankment, and it is estimated that greater than 99% of this water is recycled for use in sluicing boiler slag and bottom ash.

EXHIBIT "D"

EXHIBIT "D"

R.M. SCHAFER GENERATING STATION COAL ASH IMPOUNDMENT SITE ASSESSMENT

RESPONSE OF NORTHERN INDIANA PUBLIC SERVICE COMPANY TO EPA'S REQUEST FOR DOCUMENTS

Ref # 1 Bates No. 000001

Drawing M-8A -- Plant Development-rev O (Project No. 5749, 5741)

2 Bates No. 000002

Drawing S-11 -- Site Clearing and Grading Plan, Sheet 1, Rev G, 11/21/74

FROM: FILE. "BORINGS SOIL. UNITS 17/18 F-3561

3 Bates No. 000003-000010

Letter with attachments, June 16, 1981; subject: Soil Borings Phase IV from T.L. Tarpley to D.L. Leone

4 Bates No. 000010A-000017

Letter June 22, 1981, Reference files: 5524 and 5527 with attachments

5 Bates No. 000018-000053

Memo from Salisbury Engineers (SE) dated 5/28/81 to D.E. Nevers with attached Boring logs. TW1 to TW5 and Sieve Analysis

6 Bates No. 000054-000069

11/16/81 report from SE to Sargent Lundy. Laboratory tests and soil samples from FGD. Product Disposal Area (Referenced file F-3561)

7 Bates No. 000070-000108

SE reports 10/9/81 boring logs (Referenced file: F3561) units 17/18

8 Bates No. 000109-000174

SE lab testing units 17 and 18, November 17, 1978

FROM: UNNAMED FOLDER

9 **Bates No. 000175-000193**

Letter and attachment, dated July 8, 1981, file 5524, unit 17 and 18 laboratory Tests for soil samples

FROM: FOLDER: DIKEWORK A2987

10 **Bates No. 000194-000196**

June 13, 1975, letter regarding Unit 14, slurry wall installation

11 **Bates No. 000197-000201**

October 19, 1976, letter with as-built drawing attachments.

12 **Bates No. 000202-000238**

Report, File A-2987, copy of specification pages 2-1-1 to 2-7-4

13 **Bates No. 000239**

Copy of blueprints

14 **Bates No. 000240**

Drawing SK-14, Rev A; dated 9/16/72; titled: Site clearing and Grubbing Plan (job 4412-3)

15 **Bates No. 000241**

Drawing S-471; Titled: Interior Pike Slope Protection; Dated 6/2/76 (job 4412-4)

16 **Bates No. 000242**

Drawing S-1; Titled: Soil Boring Location Plans, Sheet 1, Rev G; Dated 4/23/74 (job 4412-3)

17 **Bates No. 000243**

Drawing S-22; Titled: Site Clearing and Grubbing Plan, Rev B; Dated 5/1/74 (job 4412-3)

FROM: CONTRACT A2987. DIKEWORK 8/28/74

18-25 Bates No. 000244-000792

Addendum 4 to specification A-2987; A4-1 – August 28, 1974

Addendum 3, dated June 10, 1974

Addendum 2, dated May 29, 1974

Addendum 1, dated May 5, 1974, including sheets TC-1 to TC-4

Exhibit B-5, page 1-1-1 to page 1-1-6

Division 2 – Site Work, page 2-1-1 to 2-7-4

Division 3 – Pages 3-1-1 to 3-2-1

Standard specification for Earthwork (Form 1714), page 1 to page 11

FROM: DIKEWORK ENGINEERING (HANSON ENGINEERING) PO 511-72

26 Bates No. 000793-000908

Folder 5 – Reports 24 to 26

27 Bates No. 000909-001039

Folder 6 – Reports 27 to 29

28 Bates No. 001040-001172

Folder 7 – Reports 30 to 32

29 Bates No. 001173-001332

Folder 8 – Reports 33 to 35

30 Bates No. 001333-001401

Folder 9 – 9/16/75, Page 1 and weekly report 37

31 Bates No. 001402

Folder 10 – 9/30/75 Report page 1

32 **Bates No.** 001403

Folder 11 – 10/13/75 Report page 1

33 **Bates No.** 001404-001409

Folder 13; sheets starting with A&H Engineering report for 11/14/74 to Boring Log TH-75-00. Date completed 11/7/75 (total 6 pages)

34 **Bates No.** 001410-001416

Folder 12; sheets starting with “10/29/75 A&H Engineering Report” to “Report Of Measurement of Bedding Material – Final Settling Basin. Station 121+00” (Total of 7 sheets)

35 **Bates No.** 001417

Report of Grain Analysis, 10/24/75 (Rip-Rap – 4ft by 4ft area)

36 **Bates No.** 001418-001421

A&H Reports: 10/21/75; 10/22/75; 10/23/75 – station 46+00 to 58+00;
10/23/75-station 60+00

FROM: FILE: DIKEWORK ENGINEERING (HANSON ENGINEERING)

37 **Bates No.** 001422

SAME ANSWER AS RESPONSE NO. 40. - Folder 1: Dikework Engineering Hanson Engineering), RMSGS-Unit 14, PO 511-72

38 **Bates No.** 001423-001612

Folder No. 2, 2-75 to 4-11-75

39 **Bates No.** 001613-001801

Dikework Engineering (Hanson Engineering); RMSGS – Unit 14, PO511-72, Folder No. 3; 4/17/75 to 5/16/75, Reports 15 to 19

40 **Bates No.** 001802-001980

Dikework Engineering (Hanson Engineering); RMSGS – Unit 14, PO511-72, Folder No. 1; 11/12/74 to 2/75

41 Bates No. 001981-002109

Dikework Engineering (Hanson Engineering); RMSGS – Unit 14, PO511-72, Folder No. 4; 5/15/75 to 7/19/75, Reports 20 to 23

42 Bates No. 002110-002390

Subcontract SC 00034, Slurry Cut-Off Wall. T&B GWC F-3407, Construction. R.M. Schahfer Gen. Station, Units 17/18 (Complete file)

**FROM: DIKEWORK ENGINEERING (HANSON ENG.). RMSGS UNIT 14
PO 511-72, FOLDER NO. 14, REPORTS 47, 48, & 49.**

43 Bates No. 002391-002409

A&H Engineering Corporation 12/2/75, EDC-8-74 through Report on Grain Size Analysis; Rip Rap EDC-10-88

44 Bates No. 002410

A&H Engineering Corporation 11/28/75, ERC 8-73

45 Bates No. 002411-002425

Report on Grain Size Analysis 11/19/75 Rip Rap to end of file

**FROM: DIKEWORK A-2987, RMSGS UNIT 14, PO 490-72, FOLDER NO. 2,
3-11-1974 TO 12-30-1974**

46 Bates No. 002426-002447

Report on Proposed Revisions to the Provisions Stated in the State of Indiana Dept. of Natural Resources Permit for Proposed Generating Station Site on The Kankakee River, 12/4/72

47 Bates No. 002448-002449

Letter dated 2/21/75, Project No. 4412; Subject: NIPSC RMS Generating Station 14; Received Date: 2/24/75; 2 pages about Crusher Run Blast Furnace Slag; from Sargent and Lundy Engineers W.S. Adaska

48 Bates No. 002450-002451

Letter dated 1/29/75 from W. Adaska of Sargent and Lundy Engineers, received 2/2/75, 1 page front and back regarding slag slope protection

49 Bates No. 002452-002453

Letter dated 12/17/74, received 12/13/74; from Sargent and Lundy; W.S. Adeska; 2 page letter on Quality Control Program; included comments on Site Preparation (between first set of tabs)

50 Bates No. 002454-002457

Sargent and Lundy Specifications, Dikework, Rollin M. Schahfer Generation Station, Unit 14; Division Site Work, Section 2-7 - Slurry Cut off Wall, Vibrating Bean Injection Method; pages 2-7-1 to 2-7-4 (between 2nd set of tabs)

FROM: DIKEOWRK A-2987; RMSGS UNIT 14. PO 490-72. FOLDER NO. 1;
NO. 1 4-72 TO 8-1-73

51 Bates No. 002458-002461

Sargent and Lundy Letter to G.C. Kuhlman, Dated 1/4/73, Received 1/9/73; To HIPI Lyle; Subject: NIPSCO Unit 14; 4 pages (between tabs)

MYLAR DDRAWINGS/TRACINGS:

Group 1 Bates No. 002462-002474

S-1	S-11	S-23
S-2	S-12	
S-3	S-13	
S-4	S-14	
S-5	S-21	
S-10	S-22	

Group 2 Bates No. 002475-002497

S-27	S-431	S-441	S-450
S-44	S-432	S-445	S-451
S-48	S-435	S-446	S-452
S-49-1	S-436	S-447	S-453
S-49-2	S-437	S-448	S-454
S-430	S-440	S-449	

Group 3	Bates No.	002498-002510	
	S-456	S-3335	S-4030
	S-457	S-3337	
	S-458	S-3338	
	S-459	S-3339	
	S-467	S-4025	
	S-471	S-4028	

Group 4	Bates No.	002511-002532		
	C-1	C-11	C-18	C-29
	C-5	C-12	C-19	
	C-6	C-13	C-20	
	C-7	C-14	C-21	
	C-8	C-15	C-22	
	C-9	C-16	C-23	
	C-10	C-17	C-28	

Group 5	Bates No.	002533-002553		
	S-14-P	C-64	C-82	
	C-24	C-75	C-83	
	C-27	C-76	C-84	
	C-60	C-77	C-85	
	C-61 (1 of 2)	C-78	C-86	
	C-61 (2 of 2)	C-79		
	C-62	C-80		
	C-63	C-81		

ADDITIONAL DOCUMENTS PRODUCED ON AUGUST 10, 2010

52 Bates No. 002554 - 002566

Salisbury Engineering, Inc. – Field Compaction Tests, dated:
 October 18, 1974 (Report No. 3 and 4)
 October 22, 1974 (Report No. 5)
 October 25, 1974 (Report No. 6)
 November 5, 1974 (Report No. 7)
 November 6, 1974 (Report No. 8)
 November 11, 1974 (Report No. 9)

November 14, 1974 (Report No. 10)
November 21, 1974 (Report No. 11)
November 26, 1974 (Report No. 12)
December 3, 1974 (Report No. 13)
December 17, 1974 (Report No. 14 and 15)

53 Bates No. 002567 – 002571

Salisbury Engineering, Inc. – Moisture Density Relationship dated
October 20, 1973; October 30, 1973; October 18, 1974 (3);

54 Bates No. 002572 – 002576

Salisbury Engineering, Inc. – Concrete Aggregate Tests dated
April 17, 1972 (Reports 1 through 5)

55 Bates No. 002577 – 002578

Salisbury Engineering, Inc. – Concrete Aggregate Tests dated
May 2, 1972 (Reports 1 and 2)

56 Bates 002579

Salisbury Engineering, Inc. – Field compaction Tests
Dated October 31, 1973 (Report 1)

57 Bates 002580

Correspondence dated November 20, 1974, from Salisbury Engineering,
Inc. to Northern Indiana Public Service Company, Attention William Kibble,
Regarding Relative Density of Cohesionless Soil, ASTM D-2049-69, Unit
14, Wheatfield, Indiana

RESPONSE NO. 52

Salisbury Engineering, Inc. – Field Compaction Tests
Dated from 10-18-1974 to 12-17-1974

SALISBURY ENGINEERING, INC.
 1501 EAST MAIN STREET, RIFFITH, IND.
 GRIFFITH PHONE (219) 923-6690
 CHICAGO PHONE (312) 375-9092

REPORT ON
FIELD COMPACTION TESTS

C Northern Indiana Public Service Co.
L R.R #1, Box 66
E Wheatfield, Indiana 46392
N
T ATTENTION: Mr. William Kibble

P
R
O
J
E
C
T
 NIPSCO
 Unit 14
 Wheatfield, Indiana

FILE NO. 1929
 DATE 10-18-74
 SHEET 1 OF 1
 REPORT NO. 3

TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION
STONE _____	SMOOTH _____	FROZEN _____	VIBRATING PLATE _____
SAND _____ X _____	ROUGH _____ X _____	SOFT _____	VIBRATING ROLLER _____
CLAY _____	WET _____ X _____	LOOSE _____	SHEEPS FOOT ROLLER _____
SLAG _____	DRY _____	FIRM _____ X _____	RUBBER TIRE ROLLER _____ X _____

LABORATORY DATA AND PROCEDURES

ASTM D 1557-67T _____ X _____ METHOD _____ A _____
 ASTM D 698-66T _____ METHOD _____
 PROJECT SPECIFICATIONS _____
 OTHER _____
 REFERENCE TEST NO. _____ 3 _____ 4 _____
 MAXIMUM DENSITY PCF _____ 105.5 _____ 118.3 _____
 OPTIMUM MOISTURE % _____ 12.0 _____ 11.5 _____

FIELD TEST METHOD

ASTM D 1556-68T _____
 OTHER _____

SPECIFICATION REQUIREMENTS

_____ 90 % OF MAXIMUM DENSITY
 _____ % OF RELATIVE DENSITY

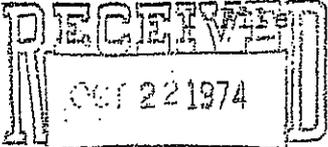
DATE OF TEST	REF. NO.	TEST NO.	DRY DENS. PCF	MOIST. %	COMPACTION %	PASS OR FAIL	REMARKS
10-9	3	1	100.0	4.5	94.7	Pass	Station 1800N Approximately 1' below grade (FINAL BASIN)
10-9	4	2	106.6	3.1	90.4	Pass	Station 2200N Approximately 1' below grade (FINAL BASIN)
10-10	3	3	108.2	5.4	102.5	Pass	ALL TESTS EAST WALL Station 2400N Approximately 1' below grade (FINAL BASIN)
MOISTURE CONTENT IN BORROW SITES							
				5.3			Hill No. 2 East
				6.6			Station 2200 Subgrade
				3.6			Hill No. 5

ROUTE	DATE	INITIAL

*TEST LOCATION ON ATTACHED PLAN IF NOT DESCRIBED IN REMARKS COLUMN.

DISTRIBUTION: 1-NIPSCO-Mr. Kibble
 1-NIPSCO-Mr. Froman
 ms

RESPECTFULLY SUBMITTED,
 SALISBURY ENGINEERING INC.



C. W. Reinert
 INSPECTOR
 John P. Austgen
 SOILS SUPERVISOR, John Austgen

PLANT CONST. OFFICE

002554

SALISBURY ENGINEERING, INC.
 1501 EAST MAIN STREET, GRIFFITH, IND.
 GRIFFITH PHONE (219) 923-6690 CHICAGO PHONE (312) 375-9092

REPORT ON
FIELD COMPACTION TESTS

CLIENT	Northern Indiana Public Service Co.	PROJECT	NIPSCO	FILE NO. 1929
	R.R. #1, Box 66		Unit 14	DATE 10-18-74
	Wheatfield, Indiana 46392		Wheatfield, Indiana	SHEET 1 OF 1
	ATTENTION: Mr. Kibble			REPORT NO. 4

TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION
STONE _____	SMOOTH _____	FROZEN _____	VIBRATING PLATE _____
SAND _____ <u>X</u>	ROUGH _____ <u>X</u>	SOFT _____	VIBRATING ROLLER _____
CLAY _____	WET _____ <u>X</u>	LOOSE _____	SHEEPS FOOT ROLLER _____
SLAG _____	DRY _____	FIRM _____ <u>X</u>	RUBBER TIRE ROLLER _____ <u>X</u>

LABORATORY DATA AND PROCEDURES	FIELD TEST METHOD
ASTM D 1557-67T _____ <u>X</u> METHOD _____ <u>A</u>	ASTM D 1556-68T _____
ASTM D 698-66T _____ METHOD _____	OTHER _____
PROJECT SPECIFICATIONS _____	
OTHER _____	
REFERENCE TEST NO. _____ <u>3</u> _____ <u>5</u>	
MAXIMUM DENSITY PCF _____ <u>105.5</u> _____ <u>108.5</u>	<u>90</u> % OF MAXIMUM DENSITY
OPTIMUM MOISTURE % _____ <u>12.0</u> _____ <u>19.5</u>	_____ % OF RELATIVE DENSITY
	SPECIFICATION REQUIREMENTS

DATE OF TEST	REF. NO.	TEST NO. *	DRY DENS. PCF	MOIST. %	COMPAC-TION %	PASS OR FAIL	REMARKS
10-15	3	1	112.6	7.4	106.7	Pass	Final Settling Basin, Station 50.00 + 35 1' below grade
10-15	3	2	104.2	6.6	98.8	Pass	Final Settling Basin Station 46.00 1' below grade
10-15	5	3	107.5	4.7	99.0	Pass	Waste Disposal Basin Station 1.00 (1+00 W) 1' below grade
10-15	5	4	118.0	5.5	108.7	Pass	Waste Disposal Basin Station 5.00 (5+00 W) 4" below grade

*TEST LOCATION ON ATTACHED PLAN IF NOT DESCRIBED IN REMARKS COLUMN.

DISTRIBUTION: 1-NIPSCO-Mr. Kibble
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 SALISBURY ENGINEERING INC.

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C. W. Reinert
 C. W. Reinert
 INSPECTOR
John P. Austgen
 SOILS SUPERVISOR, John Austgen

SALISBURY ENGINEERING, INC.
 1501 EAST MAIN STREET, GRIFFITH, IND.
 GRIFFITH PHONE (219) 923-6690
 CHICAGO PHONE (312) 375-9092

(AMMENDED COPY 12-12-74)

REPORT ON

FIELD COMPACTION TESTS

<p>C L I E N T</p>	<p>Northern Indiana Public Service Co. R.R. #1, Box 66 Wheatfield, Indiana 46392 ATTENTION: Mr. Kibble</p>	<p>P R O J E C T</p>	<p>NIPSCO Unit 14 Wheatfield, Indiana</p>	<p>FILE NO. 1929 DATE 10-22-74 SHEET 1 OF 1 REPORT NO. 5</p>
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TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION
STONE _____	SMOOTH _____	FROZEN _____	VIBRATING PLATE _____
SAND _____ X _____	ROUGH _____ X _____	SOFT _____	VIBRATING ROLLER _____
CLAY _____	WET _____ X _____	LOOSE _____	SHEEPS FOOT ROLLER _____
SLAG _____	DRY _____	FIRM _____ X _____	RUBBER TIRE ROLLER _____ X _____

LABORATORY DATA AND PROCEDURES	FIELD TEST METHOD
ASTM D 1557-67T _____ METHOD _____	ASTM D 1556-68T _____
ASTM D 698 - 66 T _____ METHOD _____	OTHER _____
PROJECT SPECIFICATIONS ASTM D-2049	
OTHER _____	
REFERENCE TEST NO. 2-A 5-A	
MAXIMUM DENSITY PCF 112.0 115.2	
OPTIMUM MOISTURE % 12.0 9.5	
	SPECIFICATION REQUIREMENTS
	_____ % OF MAXIMUM DENSITY
	75 % OF RELATIVE DENSITY

DATE OF TEST	REF. NO.	TEST NO. #	DRY DENS. PCF	MOIST. %	COMPAC-TION %	PASS OR FAIL	REMARKS
10-18	5-A	1	115.2	4.1	100+	Pass	Waste Disposal Basin, Sta. 2500 Center of Fill, 2' above subgrade
10-18	5-A	2	118.2	3.9	100+	Pass	Waste Disposal Basin, Sta. 2300 Center of Fill, 2.5' above subgrade
10-18	5-A	3	116.2	3.7	100+	Pass	Waste Disposal Basin, Sta. 2100 East Side of Fill, 2.5' above subgrade
10-18	2-A	4	113.6	8.5	100+	Pass	Final Settling Pond, Sta. 87 + 34 Center of Fill, 3.5' above subgrade
10-18	2-A	5	104.8	3.9	75	Pass	Final Settling Pond, Sta. 85 + 34 South Side of Fill, 3.5' above subgrade
10-18	2-A	6	106.0	4.4	78	Pass	Final Settling Pond, Sta. 83 + 34 North Side of Fill, 3.5' above subgrade

*TEST LOCATION ON ATTACHED PLAN IF NOT DESCRIBED IN REMARKS COLUMN.

DISTRIBUTION: 1-NIPSCO-Mr. Kibble
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John R. Postgen
 SOI'S SUPERVISOR, John Postgen

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SALISBURY ENGINEERING, INC.
 1501 EAST MAIN STREET, RIFFITH, IND.
 GRIFFITH PHONE (219) 923-6690
 CHICAGO PHONE (312) 375-9092

REPORT ON
FIELD COMPACTION TESTS

CLIENT	Indiana Public Service Company	PROJECT	NIPSCO	FILE NO. 1929
	R.R. #1, Box 66		Unit 14,	DATE 10-25-74
	Wheatfield, Indiana 46392		Wheatfield, Indiana	SHEET 1 OF 1
				REPORT NO. 6

TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION
STONE _____	SMOOTH _____	FROZEN _____	VIBRATING PLATE _____
SAND <u>X</u>	ROUGH _____	SOFT _____	VIBRATING ROLLER _____
CLAY _____	WET _____	LOOSE _____	SHEEPS FOOT ROLLER _____
SLAG _____	DRY <u>X</u>	FIRM <u>X</u>	RUBBER TIRE ROLLER <u>X</u>

LABORATORY DATA AND PROCEDURES	FIELD TEST METHOD
ASTM D 1557-67T _____ METHOD _____	ASTM D 1556-68T _____
ASTM D 698-66T _____ METHOD _____	OTHER _____
PROJECT SPECIFICATIONS ASTM D-2049	
OTHER _____	
REFERENCE TEST NO. <u>3-A</u> <u>5-A</u>	
MAXIMUM DENSITY PCF <u>112.0</u> <u>115.2</u>	<u> </u> % OF MAXIMUM DENSITY
OPTIMUM MOISTURE % <u>12.0</u> <u>9.5</u>	<u>75</u> % OF RELATIVE DENSITY

DATE OF TEST	REF. NO.	TEST NO. #	DRY DENS. PCF	MOIST. %	COMPACTION %	PASS OR FAIL	REMARKS
10-24	5-A	1	108.8	3.7	77	Pass	Waste Disposal Dike-North Wall Sta. 700 W., Center of fill 5' Above Grade
10-24	5-A	2	107.7	3.7	91	Pass	Waste Disposal Dike-North Wall Sta. 500 W., center of fill 5' above grade
10-24	5-A	3	111.5	4.5	86	Pass	Waste Disposal Dike-South Wall Sta. 700 E. center of fill 6" below grade
10-24	3-A	4	105.0	3.8	75	Pass	Final Basin-East Dike Wall Sta. 45+69, at grade
10-24	3-A	5	105.0	3.2	75	Pass	Final Basin, East Dike Wall Sta. 43+69, at grade
10-24	3-A	6	110.0	4.6	92	Pass	Final Basin-East Dike Wall Sta. 41+69, at grade

ROUTE	DATE	INITIAL
		91
		75

*TEST LOCATION ON ATTACHED PLAN IF NOT DESCRIBED IN REMARKS COLUMN.

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 SALISBURY ENGINEERING INC.

John D. Hancock John D. Hancock
 INSPECTOR

John P. Ausgen
 SOILS SUPERVISOR, John Ausgen

SALISBURY ENGINEERING, INC.
 1501 EAST MAIN STREET, GRIFFITH, IND.
 GRIFFITH PHONE (219) 923-6690
 CHICAGO PHONE (312) 375-9092

REPORT ON
FIELD COMPACTION TESTS

C Northern Indiana Public Service Co.
L R.R #1, Box 66
E Wheatfield, Indiana
N
T ATTENTION: Mr. William Kibble

P NIPSCO
R Unit 14
O Wheatfield, Indiana
J
E
C
T

FILE NO. 1929
 DATE 11-5-74
 SHEET 1 OF 1
 REPORT NO. 7

TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION
STONE _____	SMOOTH _____	FROZEN _____	VIBRATING PLATE _____
SAND <u> x </u>	ROUGH _____	SOFT _____	VIBRATING ROLLER _____
CLAY _____	WET _____	LOOSE _____	SHEEPS FOOT ROLLER _____
SLAG _____	DRY <u> x </u>	FIRM <u> x </u>	RUBBER TIRE ROLLER <u> x </u>

LABORATORY DATA AND PROCEDURES	FIELD TEST METHOD
ASTM D1557-67T _____ METHOD	ASTM D 1556-68T _____
ASTM D 698 - 66T _____ METHOD	OTHER _____
PROJECT SPECIFICATIONS ASTM D 2049-70	
OTHER _____	
REFERENCE TEST NO. <u> 3-A </u> <u> 5-A </u>	
MAXIMUM DENSITY PCF _____	<u> </u> % OF MAXIMUM DENSITY
OPTIMUM MOISTURE % _____	<u> 75 </u> % OF RELATIVE DENSITY

SPECIFICATION REQUIREMENTS

DATE OF TEST	REF. NO.	TEST NO. #	DRY DENS. PCF	MOIST. %	COMPAC-TION %	PASS OR FAIL	REMARKS
11-1	5-A	1	108.0	7.3	77	Pass	Waste disposal, center of N. Wall Station 700 W., $\frac{15}{10}$ ' above grade
11-1	5-A	2	113.7	5.7	92	Pass	Waste disposal, center of N. wall Station 500 W., $\frac{10}{10}$ ' above grade
11-1	5-A	3	115.0	5.7	100	Pass	Waste disposal, center of W. wall Sta. 20+00, $\frac{10}{8}$ ' above grade
11-1	5-A	4	111.6	5.5	88	Pass	Waste disposal, center of W. wall Sta. 24+00, 3' above grade
11-1	2-A	5	108.6	7.2	87	Pass	Final basin, center of S. wall, Sta. 89+34, 2' above grade
11-1	2-A	6	119.0	7.4	100+	Pass	Final basin, center of S. wall Sta. 87+34, 2' above grade
11-1	2-A	7	111.9	6.7	100+	Pass	Final basin, center of S. wall Sta. 84+34, 2' above grade

*TEST LOCATION ON ATTACHED PLAN IF NOT DESCRIBED IN REMARKS COLUMN.

DISTRIBUTION: 1-NIPSCO, Mr. Kibble
 1-NIPSCO, Mr. Froman
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John D. Hancock John D. Hancock
 INSPECTOR
John F. Austgen
 SOILS SUPERVISOR, John Austgen

SALISBURY ENGINEERING, INC.
 1501 EAST MAIN STREET, GRIFFITH, IND.
 GRIFFITH PHONE (219) 923-6690 CHICAGO PHONE (312) 375-9092

REPORT ON
FIELD COMPACTION TESTS

CLIENT	Northern Indiana Public Service Co.	PROJECT	NIPSCO	FILE NO. 1929
	R.R. #1, Box 66		Unit 14	DATE 11-6-74
	Wheatfield, Indiana		Wheatfield, Indiana	SHEET 1 OF 1
	ATTENTION: Mr. William Kibble			REPORT NO. 8

TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION
STONE	SMOOTH	FROZEN	VIBRATING PLATE
SAND X	ROUGH	SOFT	VIBRATING ROLLER
CLAY	WET X	LOOSE	SHEEPS FOOT ROLLER
SLAG	DRY	FIRM X	RUBBER TIRE ROLLER X

LABORATORY DATA AND PROCEDURES	FIELD TEST METHOD
ASTM D 1557-67T METHOD	ASTM D 1556-68T
ASTM D 698-66T METHOD	OTHER
PROJECT SPECIFICATIONS ASTM D 2049-70	
OTHER	
REFERENCE TEST NO. 3-A 5-A	
MAXIMUM DENSITY PCF 112.0 115.2	
OPTIMUM MOISTURE % 12.0 9.5	
	75 % OF MAXIMUM DENSITY
	75 % OF RELATIVE DENSITY

DATE OF TEST	REF. NO.	TEST NO. *	DRY DENS. PCF	MOIST. %	COMPACTION %	PASS OR FAIL	REMARKS
11-5	5-A	1	119.0	8.5	100+	Pass	Waste Pond-center of West wall, Station 2100 S., 10' above grade
11-5	5-A	2	115.9	6.7	100+	Pass	Waste Pond-Center of west wall, Station 2600 S., 3' above grade
11-5	5-A	3	109.9	9.6	82	Pass	Point of intersection west & south walls
11-5	3-A	4	105.8	7.7	77	Pass	Final Basin-center of east wall, Station 5309, 2' above grade
11-5	3-A	5	108.5	8.3	87	Pass	Final basin-center of east wall, Station 5609, 4' above grade

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*TEST LOCATION ON ATTACHED PLAN IF NOT DESCRIBED IN REMARKS COLUMN

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John D. Hancock John D. Hancock
 INSPECTOR
John R. Rustgen
 SOILS SUPERVISOR, John Rustgen

002559

To: M.C. SALISBURY ENGINEERING, INC.
 21 EAST MAIN STREET, GRIFFITH, IND.
 CHICAGO PHONE (312) 375-9092
 FIFTH PHONE 9) 923-6690

REPORT ON FIELD COMPACTION TESTS

Northern Indiana Public Service Co.
 R.R. #1, Box 66
 Wheatfield, Indiana 46392
 ATTENTION: Mr. William Kibble

PROJECT NIPSCO Unit 14
 Wheatfield, Indiana
 NOV 15 1974

FILE NO. 1929
 DATE 11-11-74
 SHEET 1 OF 1
 REPORT NO. 9

TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION	
	STONE _____	SMOOTH _____ X _____	FROZEN _____	VIBRATING PLATE _____
SAND _____ X _____	ROUGH _____	SOFT _____	VIBRATING ROLLER _____	
CLAY _____	WET _____	LOOSE _____	SHEEPS FOOT ROLLER _____ X _____	
SLAG _____	DRY _____	FIRM _____ X _____	RUBBER TIRE ROLLER _____	

LABORATORY DATA AND PROCEDURES
 ASTM D1557-67T _____ METHOD _____
 ASTM D 698 - 66T _____ METHOD _____
 PROJECT SPECIFICATIONS ASTM D 2049-70
 OTHER _____
 REFERENCE TEST NO. 5-A
 MAXIMUM DENSITY PCF 115.2
 OPTIMUM MOISTURE % 9.5

FIELD TEST METHOD
 ASTM D 1556-68T _____
 OTHER _____
 SPECIFICATION REQUIREMENTS
 _____ % OF MAXIMUM DENSITY
 75 % OF RELATIVE DENSITY

DATE OF TEST	REF. NO.	TEST NO.	DRY DENS. PCF	MOIST. %	COMPACTION %	PASS OR FAIL	REMARKS
11-9	5-A	1	111.9	5.9	85	Pass	Sta. 9+75E (West pond, south dike, center dike & 2' above grade)
11-9	5-A	2	109.3	6.1	78	Pass	Sta. 7+75E (West pond, south dike, center dike & 2' above grade)
11-9	5-A	3	119.3	8.5	100+	Pass	Sta. 5+75E (West pond, south dike, center dike & 2' above grade)
11-9	5-A	4	112.5	7.9	90	Pass	Sta. 91+34 (final basin, south wall, center dike, & 5' above grade)
11-9	5-A	5	117.4	5.5	100+	Pass	Sta. 88+34 (final basin, south wall, center dike, & 5' above grade)
11-9	5-A	6	115.7	7.0	100	Pass	Sta. 85+34 (final basin, south wall, center dike, & 5' above grade)

ROUTE	DATE	INITIAL

TEST LOCATION ON

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RESPECTFULLY SUBMITTED,
 SALISBURY ENGINEERING INC.

Terry Graegin
 INSPECTOR
 John P. Austgen
 SOILS SUPERVISOR, John Austgen

SALISBURY ENGINEERING, INC.
 1501 EAST MAIN STREET, GRIFFITH, IND.
 GRIFFITH PHONE (219) 923-6690
 CHICAGO PHONE (312) 375-9092

(AMMENDED COPY 12-12-74)

REPORT ON
FIELD COMPACTION TESTS

C
 L Northern Indiana Public Service Co.
 I R.R. #1, Box 66
 E Wheatfield, Indiana 46392
 N
 T ATTENTION: Mr. William Kibble

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NIPSCO
 Unit 14
 Wheatfield, Indiana

FILE NO. 1929
 DATE 11-14-74
 SHEET 10F 1
 REPORT NO. 10

TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION
STONE _____	SMOOTH <u>X</u>	FROZEN _____	VIBRATING PLATE _____
SAND <u>X</u>	ROUGH _____	SOFT _____	VIBRATING ROLLER _____
CLAY _____	WET _____	LOOSE _____	SHEEPS FOOT ROLLER _____
SLAG _____	DRY _____	FIRM <u>X</u>	RUBBER TIRE ROLLER <u>X</u>

LABORATORY DATA AND PROCEDURES

ASTM D 1557-67T _____ METHOD _____
 ASTM D 698-66T _____ METHOD _____
 PROJECT SPECIFICATIONS ASTM D 2049 _____
 OTHER _____

REFERENCE TEST NO. 2-A 5-A
 MAXIMUM DENSITY PCF 112.0 115.2
 OPTIMUM MOISTURE % 12.0 9.5

FIELD TEST METHOD

ASTM D 1556-68T _____
 OTHER _____

SPECIFICATION REQUIREMENTS

_____ % OF MAXIMUM DENSITY
75 % OF RELATIVE DENSITY

DATE OF TEST	REF. NO.	TEST NO. #	DRY DENS. PCF	MOIST. %	COMPACTION %	PASS OR FAIL	REMARKS
							WASTE POND, SOUTH DIKE WALL 5' ABOVE GRADE
11-13	5-A	1	112.9	5.4	89	Pass	8 + 25 E.
11-13	5-A	2	114.5	7.5	99	Pass	11 + 25 E.
11-13	5-A	3	112.9	7.9	89	Pass	P. T. Southeast Wall
11-13	2-A	4	116.1	8.1	100+	Pass	Final basin, center of dike, 6' above grade at station 61 + 13
11-13	2-A	5	113.2	11.9	100+	Pass	Southeast tower peninsula, at grade
11-13	2-A	6	115.0	10.0	100+	Pass	Final basin, center of dike, 6' above grade at station 65 + 77

*TEST LOCATION ON ATTACHED PLAN IF NOT DESCRIBED IN REMARKS COLUMN.

DISTRIBUTION: 1-NIPSCO, Mr. Kibble
 1-NIPSCO, Mr. Froman
 1-File ms

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 SALISBURY ENGINEERING INC.

Terry Graegin Terry Graegin
 INSPECTOR
John R. Ausgen
 SOILS SUPERVISOR, John Ausgen

002561

SALISBURY ENGINEERING, INC.
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 CHICAGO PHONE (312) 375-9092

DEM

REPORT ON
FIELD COMPACTION TESTS

C Northern Indiana Public Service Co.
 L R.R. #1, Box 66
 E Wheatfield, Indiana 46392
 N
 T ATTENTION: Mr. William Kibble

P
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NIPSCO
 Unit 14
 Wheatfield, Indiana

FILE NO. 1929
 DATE 11-21-74
 SHEET 1 OF 1
 REPORT NO. 11

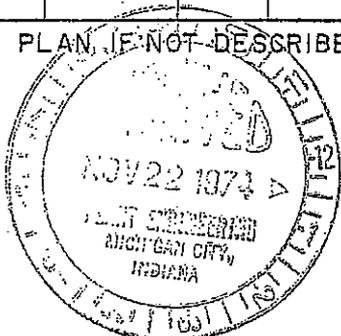
TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION
STONE _____	SMOOTH _____	FROZEN _____	VIBRATING PLATE _____
SAND _____	ROUGH _____ X	SOFT _____	VIBRATING ROLLER _____
CLAY _____ X	WET _____	LOOSE _____	SHEEPS FOOT ROLLER _____
SLAG _____	DRY _____ X	FIRM _____ X	RUBBER TIRE ROLLER _____

LABORATORY DATA AND PROCEDURES	FIELD TEST METHOD
ASTM D 1557-67T _____ METHOD _____	ASTM D 1556-68T _____
ASTM D 698-66T _____ METHOD _____	OTHER _____
PROJECT SPECIFICATIONS _____	
OTHER <u>ASTM D 2049-69</u>	
REFERENCE TEST NO. <u>3-A</u> <u>5-A</u>	
MAXIMUM DENSITY PCF <u>112.0</u> <u>115.2</u>	
OPTIMUM MOISTURE % <u>12.0</u> <u>9.5</u>	
	SPECIFICATION REQUIREMENTS
	_____ % OF MAXIMUM DENSITY
	<u>75</u> % OF RELATIVE DENSITY

DATE OF TEST	REF. NO.	TEST NO. #	DRY DENS. PCF	MOIST. %	COMPAC-TION %	PASS OR FAIL	REMARKS
WASTE POND DIKE WALL							
11-20	3-A	1	113.0	5.6	100+	Pass	Station 32 + 49, 12' above grade
11-20	3-A	2	117.5	6.7	100+	Pass	Station 39 + 40, 12' above grade
11-20	3-A	3	104.2	6.0	70	Fail	Station 26 + 35, 10' above grade
11-20	3-A	4	111.0	5.9	95	Pass	Station 33 + 35, 6' above grade
FINAL BASIN DIKE							
11-20	5-A	5	111.0	8.8	90	Pass	Center of East Tower Peninsula 6' above grade
11-20	5-A	6	120.0	8.8	100+	Pass	Dike Wall Station 67 + 77.24 8' above grade
11-20	5-A	7	119.0	10.5	100+	Pass	500' West of Test Site #6 8' above grade
11-20	5-A	8	107.5	6.9	75	Pass	Center of Middle Tower Peninsula 10' above grade

*TEST LOCATION ON ATTACHED PLAN, IF NOT DESCRIBED IN REMARKS COLUMN.

DISTRIBUTION: 1-Client
 1-Mr. Provan
 1-Mr. Gordon
 1-Mr. Mann
 1-File ms



RESPECTFULLY SUBMITTED,
 SALISBURY ENGINEERING INC.

Tom Hill Tom Hill
 INSPECTOR
John P. Austgen
 SOILS SUPERVISOR, John Austgen

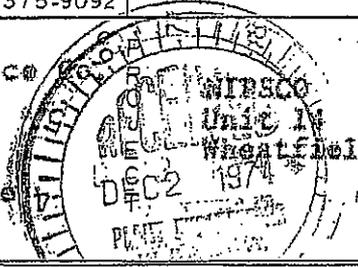
002562

SALISBURY ENGINEERING, INC.
 1501 EAST MAIN STREET, GRIFFITH, IND.
 GRIFFITH PHONE (219) 923-6690
 CHICAGO PHONE (312) 375-9092

REPORT ON
FIELD COMPACTION TESTS

CLIENT
 Northern Indiana Public Service
 R.R. #1, Box 66
 Wheatfield, Indiana 46392
 ATTENTION: Mr. William Kibble

FILE NO. 1929
 DATE 11-26-74
 SHEET 1 OF 1
 REPORT NO. 12



TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION
STONE _____	SMOOTH <u>X</u>	FROZEN _____	VIBRATING PLATE _____
SAND <u>X</u>	ROUGH _____	SOFT _____	VIBRATING ROLLER _____
CLAY _____	WET _____	LOOSE _____	SHEEPS FOOT ROLLER _____
SLAG _____	DRY <u>X</u>	FIRM <u>X</u>	RUBBER TIRE ROLLER <u>X</u>

LABORATORY DATA AND PROCEDURES	FIELD TEST METHOD
ASTM D 1557-67T _____ METHOD _____	ASTM D 1556-68T _____
ASTM D 698-66T _____ METHOD _____	OTHER _____
PROJECT SPECIFICATIONS _____	SPECIFICATION REQUIREMENTS
OTHER <u>ASTM D 2049-70</u>	
REFERENCE TEST NO. <u>5-A</u>	
MAXIMUM DENSITY PCF <u>115.2</u>	
OPTIMUM MOISTURE % <u>9.5</u>	_____ % OF MAXIMUM DENSITY
	<u>95</u> % OF RELATIVE DENSITY

DATE OF TEST	REF. NO.	TEST NO. #	DRY DENS. PCF	MOIST. %	COMPAC-TION %	PASS OR FAIL	REMARKS
							MASTER RECORDAL DIKE
11-25	5-A	1	121.7	7.0	100++	Pass	Top of dike wall at SE. Corner
11-25	5-A	2	120.0	6.1	100+	Pass	Top of dike wall at 300' W. of SE. Corner
11-25	5-A	3	120.0	6.5	100+	Pass	Top of dike wall at 600' W. of SE. Corner
11-25	5-A	4	117.0	6.3	100+	Pass	Top of dike wall at 900' W. of SE. Corner
11-25	5-A	5	121.6	7.2	100+	Pass	Top of dike wall at 1200' W. of SE. Corner
11-25	5-A	6	125.0	8.6	100+	Pass	Top of dike wall at 1500' W. of SE. Corner
11-25	5-A	7	112.6	7.3	90	Pass	Top of dike wall at 1800' W. of SE. Corner
11-25	5-A	8	118.0	4.9	100+	Pass	Top of dike wall at 2100' W. of SE. Corner

*TEST LOCATION ON ATTACHED PLAN IF NOT DESCRIBED IN REMARKS COLUMN.

DISTRIBUTION: 1-Client
 1-Mr. Fromen
 1-Mr. Gordon
 1-Mr. Mann
 1-File ms

RESPECTFULLY SUBMITTED,
 SALISBURY ENGINEERING INC.

Tom Hill
 INSPECTOR
John F. Rustgen
 SOILS SUPERVISOR, John Austgen

002563

SALISBURY ENGINEERING, INC.
 1501 EAST MAIN STREET, GRIFFITH, IND.
 GRIFFITH PHONE (219) 923-6690
 CHICAGO PHONE (312) 375-9092

REPORT ON
FIELD COMPACTION TESTS

C L I E N T
 Northern Indiana Public Service Co.
 A.P. #1, Box 55
 Wheatfield, Indiana 46392
 ATTENTION: Mr. William Kibble

FILE NO. 1929
 DATE 12-3-74
 SHEET 1 OF 1
 REPORT NO. 15



TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION
STONE _____	SMOOTH <input checked="" type="checkbox"/>	FROZEN _____	VIBRATING PLATE _____
SAND <input checked="" type="checkbox"/>	ROUGH _____	SOFT _____	VIBRATING ROLLER _____
CLAY _____	WET <input checked="" type="checkbox"/>	LOOSE _____	SHEEPS FOOT ROLLER _____
SLAG _____	DRY _____	FIRM <input checked="" type="checkbox"/>	RUBBER TIRE ROLLER <input checked="" type="checkbox"/>

LABORATORY DATA AND PROCEDURES	FIELD TEST METHOD
ASTM D 1557 - 67T _____ METHOD _____	ASTM D 1556 - 68T _____
ASTM D 698 - 66T _____ METHOD _____	OTHER _____
PROJECT SPECIFICATIONS OTHER <u>ASIM 2049-70</u>	
REFERENCE TEST NO. <u>3-A</u> <u>5-A</u>	
MAXIMUM DENSITY PCF <u>112.0</u> <u>115.2</u>	<u>75</u> % OF MAXIMUM DENSITY
OPTIMUM MOISTURE % <u>12.0</u> <u>9.5</u>	<u>75</u> % OF RELATIVE DENSITY

DATE OF TEST	REF. NO.	TEST NO. #	DRY DENS. PCF	MOIST. %	COMPAC-TION %	PASS OR FAIL	REMARKS
<u>FINAL BASIN DIKE</u>							
11-27	S-A	1	125.5	10.0	100+	Pass	Station 44 + 69.40
"	S-A	2	125.5	9.4	100+	Pass	Station 47 + 69.40
"	S-A	3	125.0	9.7	100+	Pass	Station 50 + 33.51 (P.T.)
"	S-A	4	125.0	10.5	100+	Pass	Station 54 + 08.08
<u>WASTE DISPOSAL DIKE</u>							
11-27	S-A	5	120.0	5.6	100+	Pass	Station 12 + 19.16
"	S-A	6	118.0	4.5	100+	Pass	Station 9 + 19.16
"	S-A	7	116.5	5.5	100+	Pass	Station 6 + 19.16 (P.C.-8)
"	S-A	8	122.5	7.6	100+	Pass	Station 3 + 19.16

*TEST LOCATION ON ATTACHED PLAN IF NOT DESCRIBED IN REMARKS COLUMN.

DISTRIBUTION: 1-Client
 1-Mr. Fromen
 1-Mr. Gordon
 1-Mr. Mann
 1-File ms

RESPECTFULLY SUBMITTED,
 SALISBURY ENGINEERING INC.

Tom Hill Tom Hill
 INSPECTOR
John P. Austgen
 SOILS SUPERVISOR, John Austgen

002564

SALISBURY ENGINEERING, INC.
 1501 EAST MAIN STREET, GRIFFITH, IND.
 GRIFFITH PHONE (219) 923-6690 CHICAGO PHONE (312) 375-9092

REPORT ON
FIELD COMPACTION TESTS

C Northern Indiana Public Service Co.
L R.R. #1, Box 66
I Wheatfield 46392
E
N
T ATTENTION: Mr. William Kibble

P NIPSCO
R Unit 14
O Wheatfield, Indiana
J
E
C

FILE NO. 1929
 DATE 12-17-74
 SHEET 1 OF 1
 REPORT NO. 14

TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION
STONE _____	SMOOTH <u>X</u>	FROZEN _____	VIBRATING PLATE _____
SAND <u>X</u>	ROUGH _____	SOFT _____	VIBRATING ROLLER _____
CLAY _____	WET _____	LOOSE _____	SHEEPS FOOT ROLLER _____
SLAG _____	DRY <u>X</u>	FIRM <u>X</u>	RUBBER TIRE ROLLER <u>X</u>

LABORATORY DATA AND PROCEDURES	FIELD TEST METHOD
ASTM D1557-67T _____ METHOD _____	ASTM D 1556-68T _____
ASTM D 698 - 66T _____ METHOD _____	OTHER _____
PROJECT SPECIFICATIONS _____	
OTHER <u>ASTM D 2049-69</u>	
REFERENCE TEST NO. <u>2-B</u> <u>4-A</u> <u>5-B</u>	
MAXIMUM DENSITY PCF <u>114.8</u> <u>113.1</u> <u>115.5</u>	
OPTIMUM MOISTURE % _____	
	SPECIFICATION REQUIREMENTS
	_____ % OF MAXIMUM DENSITY
	<u>75</u> % OF RELATIVE DENSITY

DATE OF TEST	REF. NO.	TEST NO.	DRY DENS. PCF	MOIST. %	COMPACTION %	PASS OR FAIL	REMARKS
WASTE DISPOSAL DIKE							
12-6	4-A	1	118.1	6.1	100+	Pass	Station 67 + 20
12-6	4-A	2	118.0	5.9	100+	Pass	Station 60 + 06
12-16	5-B	3	115.0	5.4	100+	Pass	Station 54 + 99
12-16	5-B	4	115.0	5.6	100+	Pass	Station 51 + 85
FINAL BASIN DIKE							
12-16	2-B	5	119.0	8.3	100+	Pass	Station 93 + 34.74
12-16	2-B	6	116.0	6.8	100+	Pass	Station 96 + 34
12-16	2-B	7	108.5	7.7	78	Pass	Station 99 + 34.91

*TEST LOCATION ON ATTACHED PLAN IF NOT DESCRIBED IN REMARKS COLUMN.

DISTRIBUTION: 1-Client
 1-Mr. Froman
 1-Mr. Gordon
 1-Mr. Mann
 1-File ms

002565



RESPECTFULLY SUBMITTED,
 SALISBURY ENGINEERING INC.

Tom Hill
 Tom Hill
 INSPECTOR
John R. Austgen
 SOILS SUPERVISOR, John Austgen

SALISBURY ENGINEERING, INC.
 1501 EAST MAIN STREET, GRIFFITH, IND.
 GRIFFITH PHONE (219) 923-6690
 CHICAGO PHONE (312) 375-9092

REPORT ON
FIELD COMPACTION TESTS

CLIENT
 Northern Indiana Public Service Co.
 R.R. #1, Box 66
 Wheatfield, Indiana 46392
 ATTENTION: Mr. William Kibble

PROJECT
 NIPSCO
 Unit 14
 Wheatfield, Indiana

FILE NO. 1929
 DATE 12-17-74
 SHEET 1 OF 1
 REPORT NO. 15

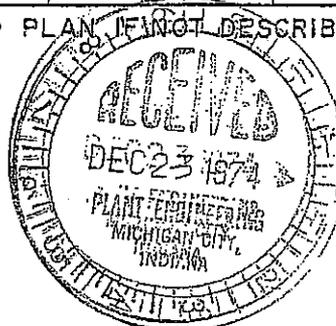
TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION
STONE _____	SMOOTH <u>X</u>	FROZEN _____	VIBRATING PLATE _____
SAND <u>X</u>	ROUGH _____	SOFT _____	VIBRATING ROLLER _____
CLAY _____	WET <u>X</u>	LOOSE _____	SHEEPS FOOT ROLLER _____
SLAG _____	DRY _____	FIRM <u>X</u>	RUBBER TIRE ROLLER <u>X</u>

LABORATORY DATA AND PROCEDURES	FIELD TEST METHOD
ASTM D 1557-67T _____ METHOD _____	ASTM D 1556-68T _____
ASTM D 698-66T _____ METHOD _____	OTHER _____
PROJECT SPECIFICATIONS _____ ASTM D 2049-69	
OTHER _____	
REFERENCE TEST NO. <u>5-B</u> <u>2-B</u>	
MAXIMUM DENSITY PCF <u>115.6</u> <u>114.8</u>	
OPTIMUM MOISTURE % _____	
	<u>75</u> % OF MAXIMUM DENSITY
	<u>75</u> % OF RELATIVE DENSITY

DATE OF TEST	REF. NO.	TEST NO.	DRY DENS. PCF	MOIST. %	COMPAC-TION %	PASS OR FAIL	REMARKS
<u>WASTE DISPOSAL DIKE</u>							
12-12	5-B	1	118.5	7.0	100+	Pass	Station 48+85, 10' above grade
12-12	5-B	2	118.4	8.0	100+	Pass	Station 54+99, 10' above grade
12-12	5-B	3	113.6	6.3	86	Pass	Station 60+06
12-12	5-B	4	113.1	6.4	90	Pass	Station 65+20
<u>FINAL BASIN DIKE</u>							
12-12	2-B	5	111.3	4.7	86	Pass	Station 97+14, 10' above grade
12-12	2-B	6	115.0	12.8	94	Pass	Station 100+35, 10' above grade
12-12	2-B	7	114.3	12.1	100+	Pass	Station 104+54, 9' above grade
12-12	2-B	8	109.6	6.6	82	Pass	Station 109+54, 2' above grade

*TEST LOCATION ON ATTACHED PLAN, IF NOT DESCRIBED IN REMARKS COLUMN.

DISTRIBUTION: 1-Client
 1-Mr. Froman
 1-Mr. Gordon
 1-Mr. Mann
 1-File ms



RESPECTFULLY SUBMITTED,
 SALISBURY ENGINEERING INC.

G. D. Foley
 INSPECTOR
 John R. Cristgen
 SOILS SUPERVISOR, John Austgen

002566

RESPONSE NO. 53

Salisbury Engineering, Inc. – Moisture Density Relationship
Dated from 10-20-1973 to 10-18-1974

SALISBURY ENGINEERING INC.
611 E. MAIN STREET, () FIFTH, IND.

MOISTURE-DENSITY RELATIONSHIP

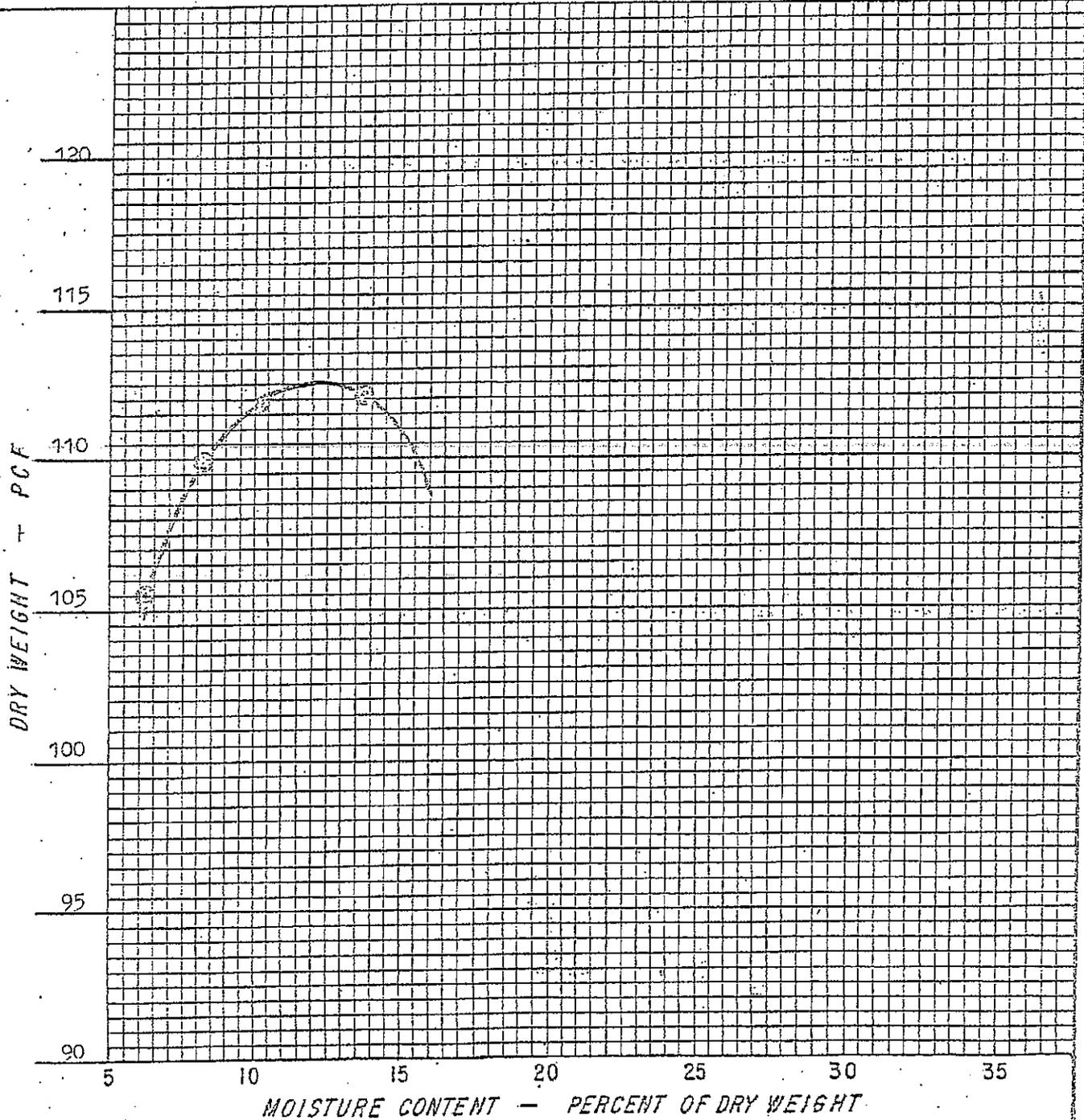
Reported to:
NORTHERN INDIANA PUBLIC SERVICE Co.
R.R. #1
Box 66
WHEATFIELD, ILLINOIS

Project Location:
NIPSCO, UNIT #14
WHEATFIELD, ILLINOIS

File 1929
Date 10-30-73

REF #1

SOURCE OF MATERIAL ON SITE MATERIAL
CLASSIFICATION OF MATERIAL GRAY FINE TO COARSE SAND, TRACE OF GRAVEL
METHOD OF COMPACTION MODIFIED ASTM D 1557-70T
HAMMER WEIGHT 10 lbs. FALL 18 IN NO. OF LAYERS 5
MOLD SIZE 4 INCHES MAX. DENSITY 113.0 PCF OPT. MOISTURE 12.0 %



002567

SALISBURY ENGINEERING INC.
611 E. MAIN STREET, GRIFFITH, IND.

MOISTURE DENSITY RELATIONSHIP

Reported to:
NORTHERN INDIANA PUBLIC SERVICE Co.
R.R. #1
Box 66
WHEATFIELD, ILLINOIS

Project Location:
NIPSCO, UNIT #14
WHEATFIELD, ILLINOIS

File 1929
Date 10-30-73
REF. #2

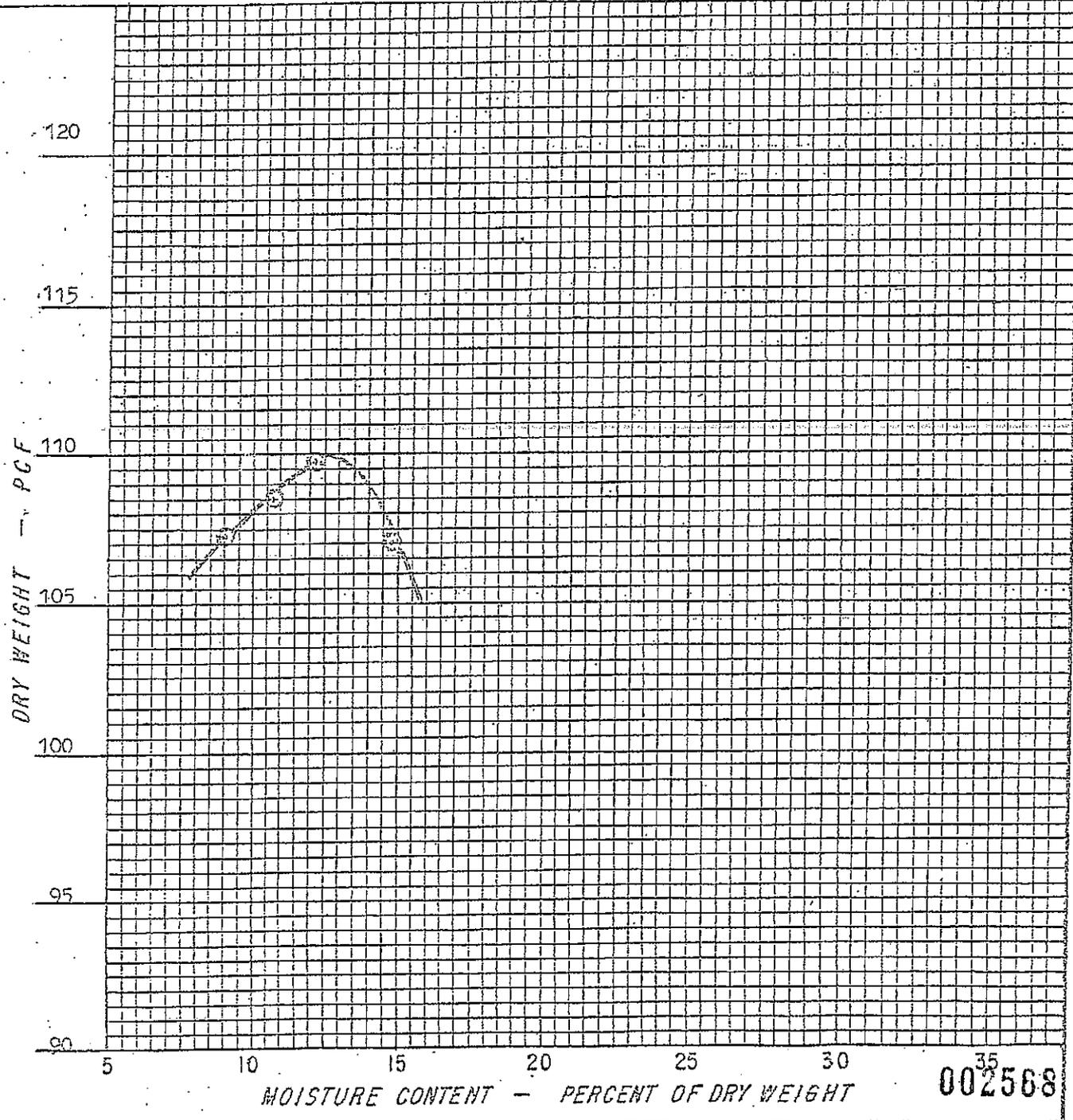
SOURCE OF MATERIAL ON SITE MATERIAL

CLASSIFICATION OF MATERIAL BROWN FINE TO MEDIUM SAND, TRACES OF CLAY AND SILT

METHOD OF COMPACTION MODIFIED ASTM D 1557-70T

HAMMER WEIGHT 10 lbs. FALL 18 IN. NO. OF LAYERS 5

MOLD SIZE 4 INCHES MAX. DENSITY 110.0 PCF OPT. MOISTURE 12.5 %



002568

SALISBURY ENGINEERING INC.
611 E. MAIN STREET, C. FFITH, IND.

MOISTURE DENSITY RELATIONSHIP

Reported to:
NORTHERN INDIANA PUBLIC SERVICE Co.
R. R. #1, Box 66
WHEATFIELD, INDIANA

Project Location:
UNIT 14
WHEATFIELD, INDIANA

File 1929
Date 10-18-74
REF #3

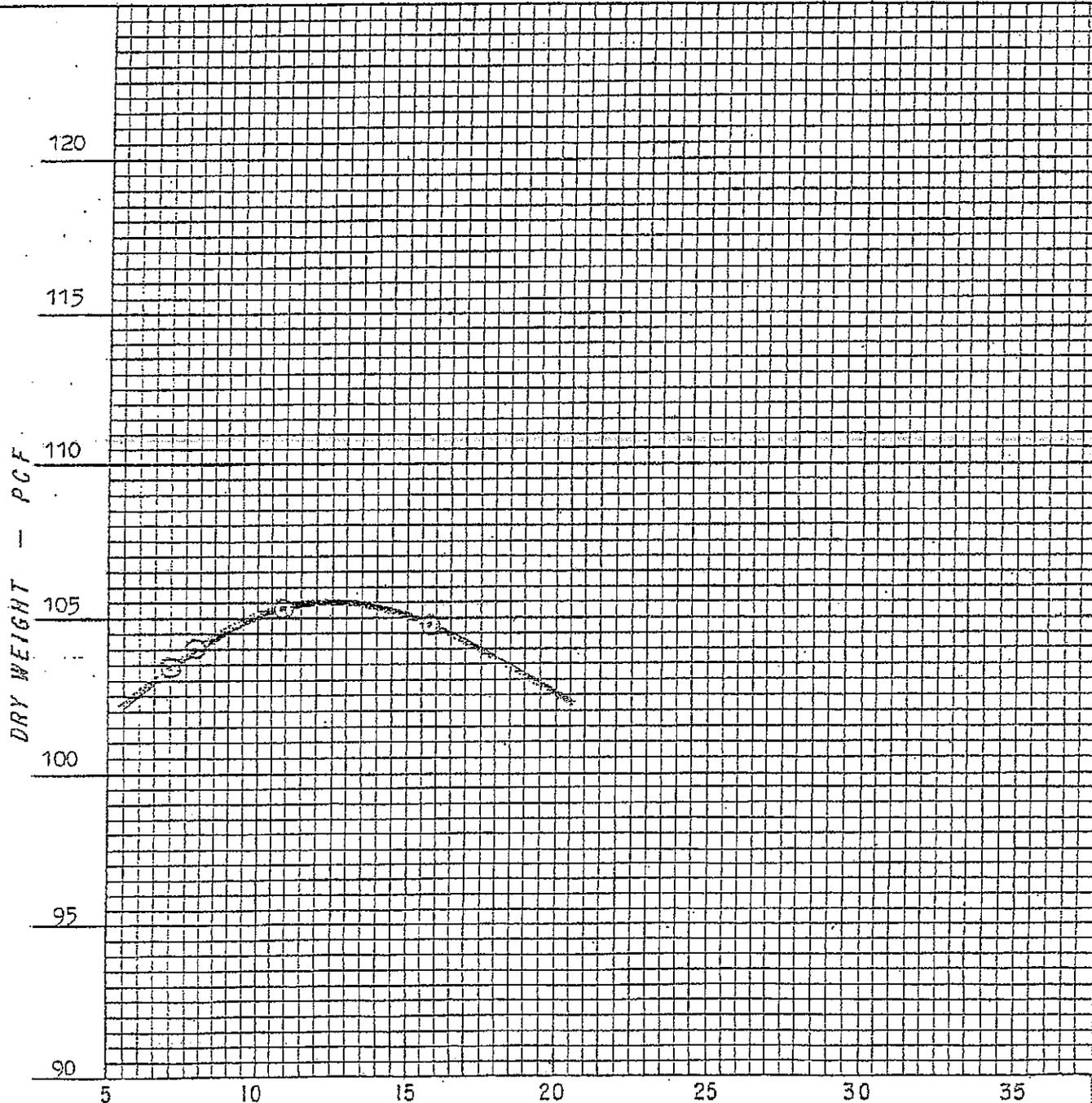
SOURCE OF MATERIAL ON SITE (HILL #2 EAST)

CLASSIFICATION OF MATERIAL BROWN FINE TO MEDIUM SAND

METHOD OF COMPACTION MODIFIED ASTM D 1557-70T

HAMMER WEIGHT 10 lbs. FALL 18 IN NO. OF LAYERS 5

MOLD SIZE 4 INCHES MAX. DENSITY 105.5 PCF OPT. MOISTURE 12.0 %



MOISTURE CONTENT - PERCENT OF DRY WEIGHT

002569

SALISBURY ENGINEERING INC.
611 E. MAIN STREET, CFFITH, IND.

MOISTURE-DENSITY RELATIONSHIP

Reported to:
NORTHERN INDIANA PUBLIC SERVICE Co.
R. R. #1, Box 66
WHEATFIELD, INDIANA

Project Location:
UNIT 14
WHEATFIELD, INDIANA

File 1929
Date 10-18-74
REF #4

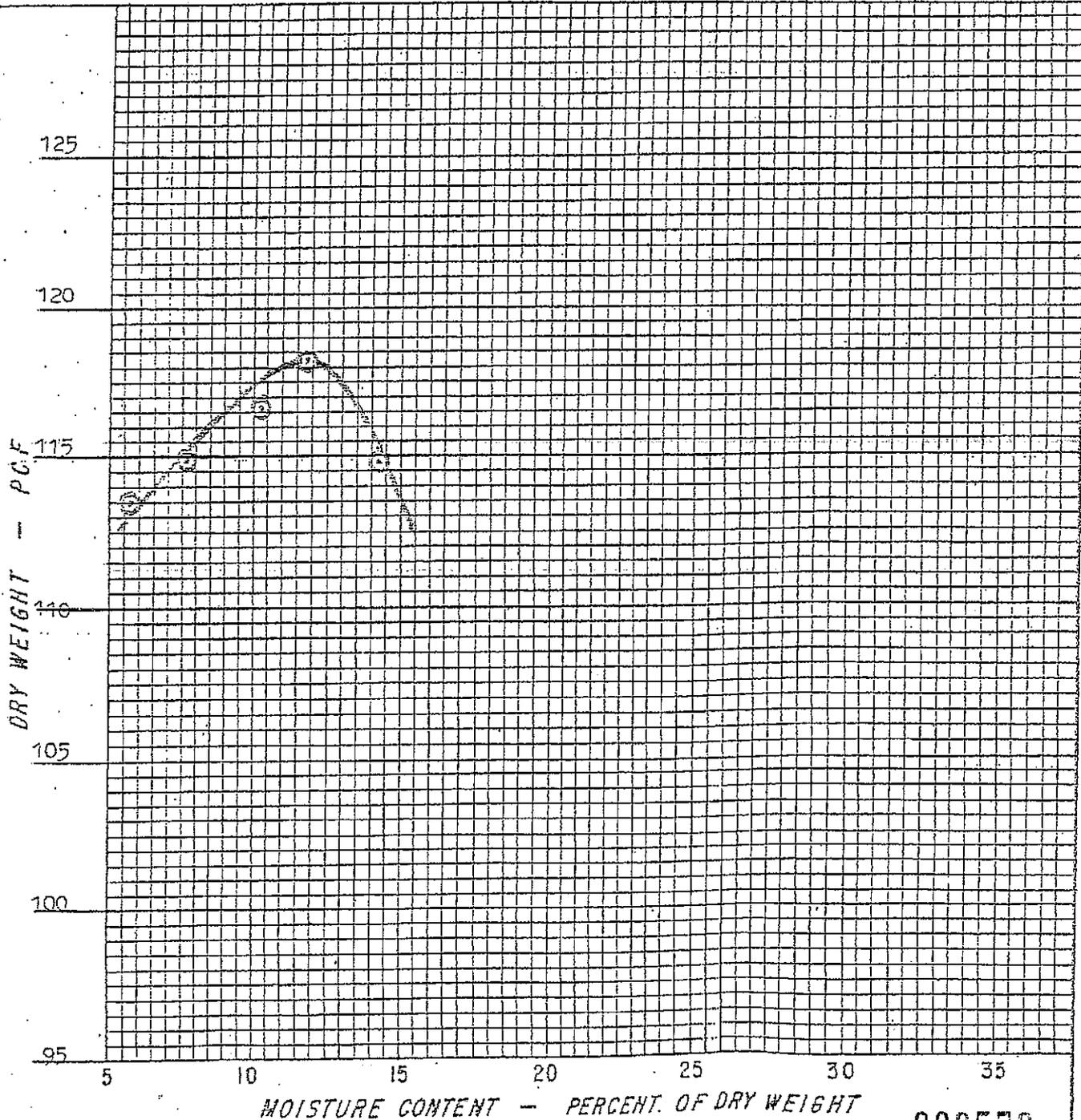
SOURCE OF MATERIAL NIPSCO UNIT 14 WHEATFIELD

CLASSIFICATION OF MATERIAL LIGHT BROWN MEDIUM SAND WITH SOME CLAY

METHOD OF COMPACTION MODIFIED ASTM D 1557-70T

HAMMER WEIGHT 10 lbs. FALL 18 IN NO. OF LAYERS 5

MOLD SIZE 4 INCHES MAX. DENSITY 118.3 PCF OPT. MOISTURE 11.5 %



002570

SALISBURY ENGINEERING INC.
611 E. MAIN STREET, GIFFITH, IND.

MOISTURE DENSITY RELATIONSHIP

Reported to:

NORTHERN INDIANA PUBLIC SERVICE Co.
R.R. #1, Box 66
WHEATFIELD, INDIANA

Project Location:

UNIT 14
WHEATFIELD, INDIANA

File 1929

Date 10-18-74

REF. #5

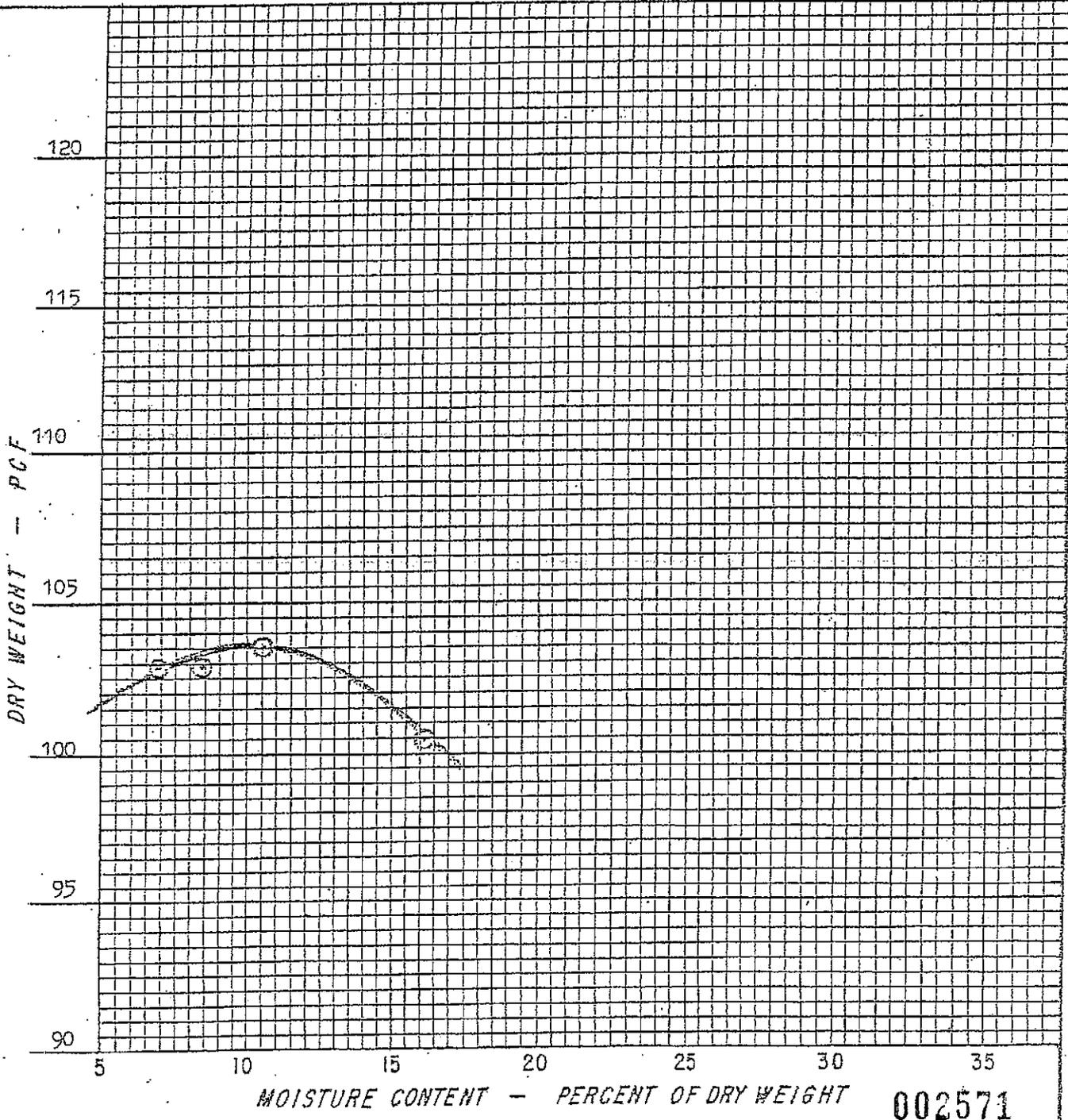
SOURCE OF MATERIAL ON SITE MATERIAL (HILL #5)

CLASSIFICATION OF MATERIAL BROWN FINE TO MEDIUM SAND

METHOD OF COMPACTION MODIFIED ASTM D 1557-70T

HAMMER WEIGHT 10 lbs. FALL 18 IN NO. OF LAYERS 5

MOLD SIZE 4 INCHES MAX. DENSITY 108.5 PCF OPT. MOISTURE 9.5 %



002571

RESPONSE NO. 54

Salisbury Engineering, Inc. – Concrete Aggregate Tests
Dated April 17, 1972

SALISBURY ENGINEERING INC.

611 EAST MAIN STREET, GRIFFITH, IND

GRIFFITH PHONE
(219) 923 - 6690

CHICAGO PHONE
(312) 375 - 9092

REPORT ON CONCRETE AGGREGATE TESTS

TO: Northern Indiana Public Service Co. Michigan City Construction Dept. P.O. Box 318-A Michigan City, Indiana 46360 Attention: Mr. Bill Kibble	PROJECT: Aggregate Tests Van Kepple ReadyMix Babcock Quarry	FILE NO.: 1929 DATE: 4-17-72 SHEET <u>1</u> OF <u>1</u> REPORT NO.: 1
---	---	--

MATERIAL Fine aggregate (sand) SOURCE Stockpile

DATE SAMPLED 4-4-72 LOCATION Van Kepple Ready Mix

UNIT WEIGHT, DRY RODDED (ASTM C-29) 110.5 PCF, LOOSE DRY 100.9 PCF

SPECIFIC GRAVITY 2.65 PERCENT MOISTURE _____

DETERMINATION OF CLAY LUMPS (ASTM C-136) _____

AMOUNT OF MATERIAL FINER THAN # 200 SEIVE (ASTM C-117) 0.5%

ORGANIC IMPURITIES-COLORIMETRIC TEST (ASTM C-40) _____

FINENESS MODULUS (ASTM C-125) 2.97, STAIN TEST (ASTM C-331) _____

LOS ANGELES ABRASION TEST (ASTM C-132), PERCENT WEAR _____ GRADING _____

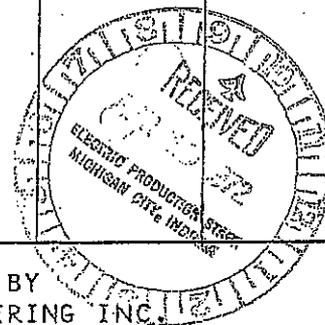
SOUNDNESS - SODIUM SULFATE TEST (ASTM C-88) PERCENT LOSS _____

GRADATION (ASTM C-136)

SIEVE SIZE	% RET.	% PASS	SPECS.
3/8	0	100	100
4	1	99	95-100
8	15	85	80-100
16	38	62	50-85
30	61	39	25-60
50	87	13	10-30
100	98	2	2-10
200	99.5	.5	--

SODIUM SULFATE SOUNDNESS TEST (ASTM C-88)

PASSING	RETAINED	GRADING	ACTUAL % LOSS	CORRECTED % LOSS



- cc: 1 - NIPSCO, Mr. Kibble
 1 - NIPSCO, Mr. Mann
 1 - Sargent & Lundy
 1 - File ns

SUBMITTED BY
 SALISBURY ENGINEERING INC.

 M. H. SALISBURY, P.E.

002572

SALISBURY ENGINEERING INC.

511 EAST MAIN STREET, GRIFFITH, IND

GRIFFITH PHONE
(219) 923 - 6690

CHICAGO PHONE
(312) 575 - 9092

REPORT ON CONCRETE AGGREGATE TESTS

TO:

PROJECT:

Northern Indiana Public Service Co.
Michigan City Construction Dept.
P.O. Box 318-A
Michigan City, Indiana 46360
Attention: Mr. Bill Kibble

Aggregate Tests
Van Kepple Ready Mix
Babcock Quarry

FILE NO. 1929
DATE: 4-17-72
SHEET 1 OF 1
REPORT NO.: 2

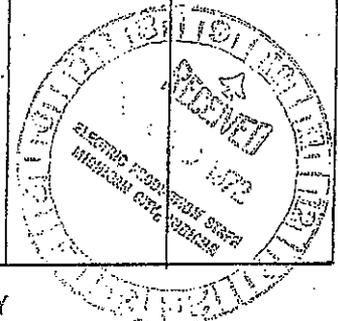
MATERIAL Indiana #5 Stone SOURCE Stockpile
 DATE SAMPLED 4-4-72 LOCATION Van Kepple Ready Mix
 UNIT WEIGHT, DRY RODDED (ASTM C-29) 97.3 PCF, LOOSE DRY -- PCF
 SPECIFIC GRAVITY 2.76 PERCENT MOISTURE --
 DETERMINATION OF CLAY LUMPS (ASTM C-136) _____
 AMOUNT OF MATERIAL FINER THAN # 200 SEIVE (ASTM C-117) 1.0
 ORGANIC IMPURITIES-COLORIMETRIC TEST (ASTM C-40) _____
 FINENESS MODULUS (ASTM C-125) _____, STAIN TEST (ASTM C-331) _____
 LOS ANGELES ABRASION TEST (ASTM C-132), PERCENT WEAR 23% GRADING 3
 SOUNDNESS - SODIUM SULFATE TEST (ASTM C-88) PERCENT LOSS 0.72

GRADATION (ASTM C-136)

SIEVE SIZE	% RET.	% PASS	SPECS.
1 1/2	0	100	100
1	13	87	85-98
3/4	59	41	60-85
1/2	87	13	30-60
3/8	94	6	10-35
4	97	3	0-10
8	98	2	0-5
200	99	1	0-1

SODIUM SULFATE SOUNDNESS TEST (ASTM C-88)

PASSING	RETAINED	GRADING	ACTUAL % LOSS	CORRECTED % LOSS



cc: 1 - NIPSCO, Mr. Kibble
 1 - NIPSCO, Mr. Mann
 1 - Sargent & Lundy
 1 - File ns

SUBMITTED BY
SALISBURY ENGINEERING INC.

M. H. Salisbury
M. H. Salisbury, P.E.

002573

SALISBURY ENGINEERING INC.

611 EAST MAIN STREET, GRIFFITH, IND

GRIFFITH PHONE
(219) 923 - 6690

CHICAGO PHONE
(312) 375 - 9092

REPORT ON CONCRETE AGGREGATE TESTS

TO: Northern Indiana Public Service Co. PROJECT: Aggregate Tests
Michigan City Construction Dept. Van Kepple Ready Mix
P.O. Box 318-A Babcock Quarry
Michigan City, Indiana 46360

FILE NO.: 1929
DATE: 4-17-72
SHEET 1 OF 1
REPORT NO.: 3

Attention: Mr. Bill Kibble

MATERIAL Indiana #9 Stone SOURCE Stockpile
DATE SAMPLED 4-4-72 LOCATION Van Kepple Ready Mix
UNIT WEIGHT, DRY RODDED (ASTM C-29) 97.4 PCF, LOOSE DRY _____ PCF
SPECIFIC GRAVITY 2.76 PERCENT MOISTURE _____
DETERMINATION OF CLAY LUMPS (ASTM C-136) _____
AMOUNT OF MATERIAL FINER THAN # 200 SEIVE (ASTM C-117) 1.0
ORGANIC IMPURITIES-COLORIMETRIC TEST (ASTM C-40) _____
FINENESS MODULUS (ASTM C-125) _____, STAIN TEST (ASTM C-331) _____
LOS ANGELES ABRASION TEST (ASTM C-132); PERCENT WEAR 25.6 GRADING B
SOUNDNESS - SODIUM SULFATE TEST (ASTM C-88) PERCENT LOSS 1.15

GRADATION (ASTM C-136)

SIEVE SIZE	% RET.	% PASS	SPECS.
1	0	100	--
3/4	17	83	100
1/2	65	35	65-85
3/8	85	15	20-55
4	97	3	0-10
200	99	1	0-2

SODIUM SULFATE SOUNDNESS TEST (ASTM C-88)

PASSING	RETAINED	GRADING	ACTUAL % LOSS	CORRECTED % LOSS



- cc: 1 - NIPSCO, Mr. Kibble
1 - NIPSCO, Mr. Mann
1 - Sargent & Lundy
1 - File ns

SUBMITTED BY
SALISBURY ENGINEERING INC.

M. H. Salisbury
M. H. Salisbury, P.E.

002574

SALISBURY ENGINEERING INC.

611 EAST MAIN STREET, GRIFFITH, IND

GRIFFITH PHONE
(219) 923 - 6690

CHICAGO PHONE
(312) 375 - 9092

REPORT ON
CONCRETE AGGREGATE TESTS

TO: Northern Indiana Public Service Co. PROJECT: Aggregate Tests

Michigan City Construction Dept.
P.O. Box 318-A
Michigan City, Indiana 46360

Metz Quarry

FILE NO.: 1929
DATE: 4-17-72
SHEET 1 OF 1
REPORT NO.: 4

Attention: Mr. Bill Kibble

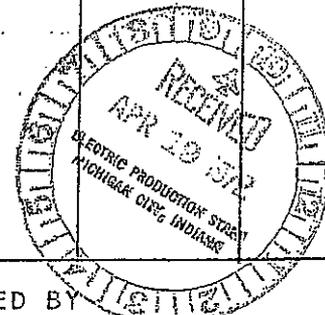
MATERIAL Indiana #5 SOURCE Metz Quarry
 DATE SAMPLED 4-7-74 LOCATION Rensselaer, Indiana
 UNIT WEIGHT, DRY RODDED (ASTM C-29) 104.2 PCF, LOOSE DRY --- PCF
 SPECIFIC GRAVITY 2.74 PERCENT MOISTURE --
 DETERMINATION OF CLAY LUMPS (ASTM C-136) _____
 AMOUNT OF MATERIAL FINER THAN # 200 SEIVE (ASTM C-117) 0.4
 ORGANIC IMPURITIES-COLORIMETRIC TEST (ASTM C-40) _____
 FINENESS MODULUS (ASTM C-125) _____, STAIN TEST (ASTM C-331) _____
 LOS ANGELES ABRASION TEST (ASTM C-132), PERCENT WEAR 19% GRADING A
 SOUNDNESS - SODIUM SULFATE TEST (ASTM C-88) PERCENT LOSS 0.0%

GRADATION (ASTM C-136)

SIEVE SIZE	% RET.	% PASS	SPECS.
1 1/2	0	100	100
1	8	92	85-98
3/4	32	68	60-85
1/2	68	32	30-60
3/8	85	15	10-35
4	97	3	0-10
8	99	1	0-5
200	99.6	0.4	0-1

SODIUM SULFATE SOUNDNESS TEST (ASTM C-88)

PASSING	RETAINED	GRADING	ACTUAL % LOSS	CORRECTED % LOSS



SUBMITTED BY
SALISBURY ENGINEERING INC.

M. H. Salisbury

M. H. Salisbury, P.E.

- cc: 1 - NIPSCO, Mr. Kibble
- 1 - NIPSCO, Mr. Mann
- 1 - Sargent & Lundy
- 1 - File ns

002575

SALISBURY ENGINEERING INC.

611 EAST MAIN STREET, GRIFFITH, IND

GRIFFITH PHONE
(219) 923 - 6690

CHICAGO PHONE
(312) 375 - 9092

REPORT ON
CONCRETE AGGREGATE TESTS

TO: Northern Indiana Public Service Co. PROJECT:

Michigan City Construction Dept.
P.O. Box 318-A
Michigan City, Indiana 46360

Aggregate Tests
Metz Quarry

FILE NO.: 1929
DATE: 4-17-72
SHEET 1 OF 1
REPORT NO.: 5

Attention: Mr. Bill Kibble

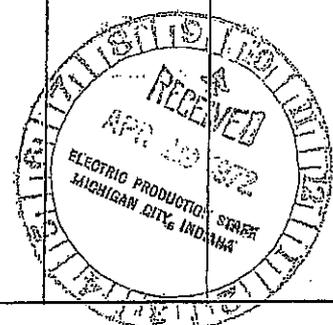
MATERIAL Indiana #9 SOURCE Metz Quarry
DATE SAMPLED 4-7-72 LOCATION Rensselaer, Indiana
UNIT WEIGHT, DRY RODDED (ASTM C-29) 105.1 PCF, LOOSE DRY - PCF
SPECIFIC GRAVITY 2.74 PERCENT MOISTURE --
DETERMINATION OF CLAY LUMPS (ASTM C-136) --
AMOUNT OF MATERIAL FINER THAN # 200 SEIVE (ASTM C-117) 0.4
ORGANIC IMPURITIES-COLORIMETRIC TEST (ASTM C-40) --
FINENESS MODULUS (ASTM C-125) --, STAIN TEST (ASTM C-331) --
LOS ANGELES ABRASION TEST (ASTM C-132), PERCENT WEAR 21.2% GRADING B
SOUNDNESS - SODIUM SULFATE TEST (ASTM C-88) PERCENT LOSS 0.0%

GRADATION (ASTM C-136)

SIEVE SIZE	% RET.	% PASS	SPECS.
1	0	100	100
3/4	0	100	90-100
1/2	24	76	---
3/8	64	36	20-55
4	94	6	0-10
8	98	2	0-5
200	99.6	0.4	--

SODIUM SULFATE SOUNDNESS TEST (ASTM C-88)

PASSING	RETAINED	GRADING	ACTUAL % LOSS	CORRECTED % LOSS



- cc: 1 - NIPSCO, Mr. Kibble
1 - NIPSCO, Mr. Mann
1 - Sargent & Lundy
1 - File ns

SUBMITTED BY
SALISBURY ENGINEERING INC.

M. H. Salisbury
M. H. Salisbury, P.E.

002576

RESPONSE NO. 55

Salisbury Engineering, Inc. – Concrete Aggregate Tests
Dated May 2, 1972

SALISBURY ENGINEERING INC.
 611 EAST MAIN STREET, GRIFFITH, IND
 GRIFFITH PHONE (219) 923 - 6690
 CHICAGO PHONE (312) 375 - 9092

REPORT ON
~~CONCRETE~~ **CONCRETE AGGREGATE TESTS**
Mostly Road material

TO:
 Northern Indiana Public Service Co.
 Michigan City Construction Dept.
 P.O. Box 318-A
 Michigan City, Indiana 46360
ATTENTION: Mr. Bill Kibble

PROJECT:
 Western Indiana
 Aggregates Inc.
 Francesville Quarry

UNIT 14
 FILE NO.: 1929
 DATE: 5-2-72
 SHEET 1 OF 1
 REPORT NO.: 1

MATERIAL Indiana #9 Stone SOURCE Quarry
 DATE SAMPLED 4-18-72 LOCATION Francesville, Indiana
 UNIT WEIGHT, DRY RODDED (ASTM C-29) 98.7 PCF, LOOSE DRY --- PCF
 SPECIFIC GRAVITY 2.73 PERCENT MOISTURE ---
 DETERMINATION OF CLAY LUMPS (ASTM C-136) ---
 AMOUNT OF MATERIAL FINER THAN # 200 SEIVE (ASTM C-117) 0.3
 ORGANIC IMPURITIES-COLORIMETRIC TEST (ASTM C-40) ---
 FINENESS MODULUS (ASTM C-125) ---, STAIN TEST (ASTM C-331) ---
 LOS ANGELES ABRASION TEST (ASTM C-132), PERCENT WEAR 19 GRADING B
 SOUNDNESS - SODIUM SULFATE TEST (ASTM C-88) PERCENT LOSS 0.0

GRADATION (ASTM C-136)

SIEVE SIZE	% RET.	% PASS	SPECS.
3/4	0	100	100
1/2	15	85	65-85
3/8	53	47	20-55
4	97	3	0-10
200	99.7	0.3	0-2

SODIUM SULFATE SOUNDNESS TEST (ASTM C-88)

PASSING	RETAINED	GRADING	ACTUAL % LOSS	CORRECTED % LOSS



cc: 1-NIPSCO-Mr. Kibble
 1-NIPSCO-Mr. Mann
 1-Sargent & Lundy
 1-Wanatah Trucking Co.
 1-File dr

SUBMITTED BY
SALISBURY ENGINEERING INC.
M. H. Salisbury
 M. H. Salisbury, P.E.

002577

SALISBURY ENGINEERING INC.

611 EAST MAIN STREET, GRIFFITH, IND

GRIFFITH PHONE
(219) 923 - 6690

CHICAGO PHONE
(312) 375 - 9092

REPORT ON
CONCRETE AGGREGATE TESTS

TO: Northern Indiana Public Service Co.
Michigan City Construction Co.
P.O. Box 318-A
Michigan City, Indiana 46360

PROJECT: Western Indiana
Aggregates Inc.
Francesville Quarry

FILE NO.: 1929
DATE: 5-2-72
SHEET 1 OF 1
REPORT NO.: 2

ATTENTION: Mr. Bill Kibble

MATERIAL Indiana #5 Stone SOURCE Quarry

DATE SAMPLED 4-18-72 LOCATION Francesville, Indiana

UNIT WEIGHT, DRY RODDED (ASTM C-29) 100.2 PCF, LOOSE DRY --- PCF

SPECIFIC GRAVITY 2.74 PERCENT MOISTURE ---

DETERMINATION OF CLAY LUMPS (ASTM C-136) ---

AMOUNT OF MATERIAL FINER THAN # 200 SEIVE (ASTM C-117) 0.3

ORGANIC IMPURITIES-COLORIMETRIC TEST (ASTM C-40) ---

FINENESS MODULUS (ASTM C-125) ---, STAIN TEST (ASTM C-331) ---

LOS ANGELES ABRASION TEST (ASTM C-132), PERCENT WEAR 19 GRADING B

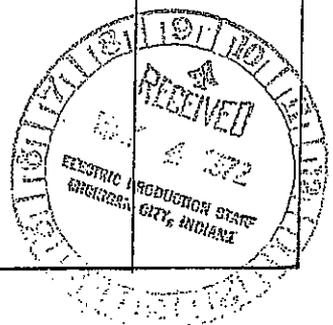
SOUNDNESS - SODIUM SULFATE TEST (ASTM C-88) PERCENT LOSS 0.0

GRADATION (ASTM C-136)

SIEVE SIZE	% RET.	% PASS	SPECS.
1 1/2"	0	100	100
1"	3	97	85-98
3/4"	19	81	60-85
1/2"	67	33	30-60
3/8"	88	12	10-35
4"	98	2	0-10
8"	99	1	0-5
200	99.7	0.3	0-1

SODIUM SULFATE SOUNDNESS TEST (ASTM C-88)

PASSING	RETAINED	GRADING	ACTUAL % LOSS	CORRECTED % LOSS



cc: 1-NIPSCO-Mr. Kibble
1-NIPSCO-Mr. Mann
1-Sargent & Lundy
1-Wanatah Trucking Co.
1-File dr

SUBMITTED BY
SALISBURY ENGINEERING INC.
M. H. Salisbury
M. H. Salisbury, P.E.

002578

RESPONSE NO. 56

Salisbury Engineering, Inc. – Field Compaction Tests
Dated 10-31-1973

SALISBURY ENGINEERING, INC.
 1501 EAST MAIN STREET, GRIFFITH, IND.
 GRIFFITH PHONE (219) 923-6690
 CHICAGO PHONE (312) 375-9092

REPORT ON
FIELD COMPACTION TESTS

C L E N T	PROJECT Northern Indiana Public Service Co. R.R. #1, Box 56 Wheatfield, Indiana 46392 ATTENTION: Mr. William Kibble	Unit 14 Wheatfield, Indiana	FILE NO. 1929 DATE 10-31-73 SHEET 1 OF 1 REPORT NO. 1
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TYPE OF FILL	CONDITION OF GRADE		METHOD OF COMPACTION
STONE _____	SMOOTH _____ X _____	FROZEN _____	VIBRATING PLATE _____ X _____
SAND _____ X _____	ROUGH _____	SOFT _____	VIBRATING ROLLER _____ X _____
CLAY _____	WET _____	LOOSE _____	SHEEPS FOOT ROLLER _____
SLAG _____	DRY _____ X _____	FIRM _____ X _____	RUBBER TIRE ROLLER _____

LABORATORY DATA AND PROCEDURES	FIELD TEST METHOD
ASTM D1557-67T _____ X _____ METHOD _____ A _____	ASTM D 1556-68T _____
ASTM D 698 - 66T _____ METHOD _____	OTHER _____
PROJECT SPECIFICATIONS _____	SPECIFICATION REQUIREMENTS
OTHER _____	
REFERENCE TEST NO. _____ 1 _____ 2 _____	
MAXIMUM DENSITY PCF 113.0 _____ 110.0 _____	_____ 95 _____ % OF MAXIMUM DENSITY
OPTIMUM MOISTURE % 12.0 _____ 12.5 _____	_____ % OF RELATIVE DENSITY

DATE OF TEST	REF. NO.	TEST NO. #	DRY DENS. PCF	MOIST. %	COMPAC-TION %	PASS OR FAIL	REMARKS
10-26	1	1	114.2	8.0	101.0	Pass	Circulating Water Pipe
"	"	2	120.5	8.1	106.5	Pass	348' West of 11 + 87 E. Manholes
"	"	3	107.3	3.2	95.0	Pass	174' West of 11 + 87 E. Manholes
"	"	4	115.5	5.2	102.2	Pass	120' East of 11 + 87 E. Manholes
"	2	5	115.5	7.4	105.0	Pass	300' East of 11 + 87 E. Manholes
"	"	6	121.5	6.5	110.0	Pass	E Foundations, 138 Switchyard
"	"	7	111.7	4.3	101.5	Pass	E Foundations, 138 Switchyard
"	"	8	116.9	6.9	106.0	Pass	C.B. Foundations, 138 Switchyard
"	"	9	119.0	4.7	108.0	Pass	D Foundation, 138 Switchyard
							U Foundations, 345 Switchyard

1115

110.9 99.0

*TEST LOCATION ON ATTACHED PLAN IF NOT DESCRIBED IN REMARKS COLUMN.

DISTRIBUTION: 1 - NIPSCO-Mr. Kibble
 1 - NIPSCO-Mr. Froman
 1 - File dr

RESPECTFULLY SUBMITTED,
 SALISBURY ENGINEERING INC.

Allan Bilka
 INSPECTOR
John A. Austgen
 SOILS SUPERVISOR, John Austgen

002579

RESPONSE NO. 57

Correspondence from Salisbury Engineering, Inc. to NIPSCO
Dated 11-20-1974



SALISBURY ENGINEERING INC.

P.O. BOX 270 1501 E. MAIN STREET GRIFFITH, INDIANA 46319
GRIFFITH PHONE (219) 823-6690 CHICAGO PHONE (312) 375-9092

November 20, 1974

File 1929



Northern Indiana Public Service Co.
R.R. #1, Box 66
Wheatfield, Indiana 46392

ATTENTION: Mr. William Kibble

Subject: Relative Density of
Cohesionless Soil
ASTM D-2049-69
Unit 14
Wheatfield, Indiana

Gentlemen:

Listed below are the results of the soil samples from two
Locations of site material used for backfill.

Ref. #3-A	Minimum Density - 89.0 pcf
Hill #2	Maximum Density - 112.0 pcf
Ref. #5-A	Minimum Density - 89.0 pcf
Hill #5	Maximum Density - 115.2 pcf

We trust this information is suitable for your present
purposes; however, should you have any questions, please
advise.

Very truly yours,

Salisbury Engineering Inc.

M. H. Salisbury, P.E.

MHS:dr

cc: Mr. D. L. Froman
Mr. E. L. Mann
Mr. L. Gordon

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