SUBJECT: HYDROGEOLOGIC REVIEW PROCESS: PRELIMINARY HYDROGEOLOGIC SITE EVALUATIONS

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ISSUED: 08/25/93
REVISED:

PURPOSE: This document outlines the Division of Drinking and Ground Waters' (DDAGW) procedures for performing hydrogeologic site evaluations for proposed non-hazardous treatment, storage or disposal facilities.

BACKGROUND: All newly proposed or substantially modified sanitary landfill facilities, surface impoundments, dedicated land application sites, on-site leaching systems [as requested by the Division of Surface Water (DSW)], flyash, bottom ash, foundry sand sites and Class V underground injection wells disposing of sewage, industrial waste or "other" waste as defined in Chapter 6111 of the Ohio Revised Code (ORC) shall be subject to a thorough hydrogeologic review process prior to issuance of any permits. The review process shall determine site suitability and whether ground water protection criteria can be met. Sites should be reviewed according to the following four phase process:

Phase I - Preliminary Hydrogeologic Site Evaluation
Phase II - Hydrogeologic Site Investigation Work Plan
Phase III - Hydrogeologic Site Investigation Report
Phase IV - Ground Water Monitoring Program Plan

Phases I and II aid applicants in site selection and in performing the hydrogeologic site investigation. Although an applicant is not required to complete Phases I and II prior to submitting a Permit-to-Install (PTI) application, the DDAGW recommends that applicants do so to ensure a proper site is selected and to ensure that all the required information will be gathered.

Phases III and IV are required as parts of the PTI application for landfill facilities regulated by the Division of Solid and Infectious Waste Management (DSIWM) under Rules 3745-27, 3745-29, or 3745-30 of the Ohio Administrative Code (OAC). They are also required for PTI applications processed by DSW or the Division of Environmental and Financial Assistance (DEFA) for surface impoundments, dedicated land application sites, disposal sites of non-toxic flyash, bottom ash or other applicable wastewater facilities regulated under ORC 6111. Phases III and IV may be required as part of the PTI application for a Class V underground injection well regulated by DDAGW under OAC 3745-34.

This document addresses the procedures to be followed by DDAGW staff in fulfilling a request to perform a Preliminary Hydrogeologic Site Evaluation. Phases II and III are discussed in DDAGW Procedures IP0302.200 and IP0302.300 respectively. Phase IV recommendations are discussed in DDAGW guidance GD0303.001.

PROCEDURE: Procedures to be followed by DDAGW in performing Preliminary Hydrogeologic Site Evaluations are as follows:

1. The DDAGW District Supervisor receives a work request form fromthe DEFA, or District Program Supervisor to conduct a site evaluation. The request should include an attached map locating the proposed site. Information provided in the work order request should enable the DDAGW District Geologist to obtain pertinent information about the site prior to the actual site investigation.

   The following information should be included in the site work order request of a preliminary hydrogeologic site evaluation:

   a. Site or facility address and location outlined on an attached 7-1/2 minute topographical quadrangle map;

   b. Characteristics (physical and chemical analysis) of the waste to be applied, treated or disposed at the site;

   c. Type of construction and/or treatment proposed (diked, trenched, aerated, etc.); and

   d. Types of regulated units (if any) located at the site.

2. The DEFA or District Specialist, with concurrence from the DDAGW District Geologist assigned to the project, should schedule a site inspection to be performed within ten (10) working days after receiving the site evaluation request. This is an adequate amount of time to allow the DDAGW District Geologist to assemble, review and evaluate available information about the site and complete as much of the attached worksheet as possible. It will also allow the DEFA or District Specialist flexibility in scheduling interested parties (local health department officials, facility representatives, consultants, etc.). District DDAGW Supervisors should coordinate with DEFA or District Program Supervisors if timelines cannot be met.

   (Note: Because of time restraints within the DDAGW, actual site inspections may not be performed for all requests.)

3. During the period between receiving the request and the actual site investigation, all available agronomic, hydrogeologic and land use information should be assembled by the DDAGW District Geologist. Also, any relevant information may be requested from the DEFA or District Environmental Specialist.

   In order to perform the site inspection, the following sources of information should be investigated if readily available:

   ODNR, DIVISION OF SOIL AND WATER CONSERVATION - Soil Surveys;

   NATURAL RESOURCE CONSERVATION SERVICE - Site specific soil information;

   ODNR, DIVISION OF WATER - Well logs, Ground Water Availability Maps, Ground Water reports and bulletins, etc.;

   ODNR, OHIO GEOLOGICAL SURVEY - Bibliography of Ohio geologic reports and maps;

   DDAGW/GWP - Files on facilities near the site being investigated;

OHIO EPA DISTRICT ENVIRONMENTAL SPECIALIST - Other project or site specific information may be available through the DEFA or District Environmental Specialist in charge of the project;

U.S. GEOLOGIC SURVEY - Survey Reports and maps; and

OHIO DEPARTMENT OF TRANSPORTATION - Boring records along highways and bridge formations.

The DDAGW District Geologist should assemble and evaluate the available information in order to define the site specific characteristics and fill out the pertinent portions of the attached work sheet.

4. The DDAGW District Geologist, DEFA or District Environmental Specialist and interested parties contacted by the DEFA or District Specialist conduct the site inspection.

   It is preferred that the DEFA or District Environmental Specialist and DDAGW District Geologist inspect the site together. Any interested parties should be notified by the DEFA or District Specialist in advance of the date of the site inspection and be given the opportunity to participate in the site inspection.

   Points to be observed during the site inspection are as follows:

   a. Topography of the site and geologic features;
   b. The presence of dug or drilled wells, cisterns, springs, sink holes, oil wells, mines, quarries, etc.;
   c. Soil texture and characteristics;
   d. Land use practices.
   e. Proximity of private/public water supply wells.

5. The DDAGW District Geologist completes the worksheet. The DDAGW District Geologists can then:

   a. complete the form inter-office communication (IOC) attached to this document and submit this form IOC with the worksheet and a copy of Attachment I to the DEFA or District Environmental Specialist; or

   b. prepare and submit an IOC which shall contain comments limited to only those areas addressed on the worksheets. This prepared IOC shall only discuss the limitations of the proposed sites hydrogeology to the placement or treatment of waste at the site. No conjectures shall be made as to the approvability of the site with regards to any potential permit application. The IOC also must include a disclaimer that the opinions expressed within the IOC are based only on the information currently available.

      The work-product shall be completed and transmitted to the DEFA or District Environmental Specialist within ten (10) working days following the site inspection. A copy of the final work product shall be forwarded to DDAGW-CO. District DDAGW Supervisors should coordinate with DEFA or District Program Supervisors if timelines cannot be met.

All preliminary site evaluations should include a copy of Attachment I. It will act as a guide explaining the level of information required for performing any PTI work.

ATTACHMENT I

Hydrogeologic Site Investigation Report

A hydrogeologic site investigation report shall be presented in narrative form in a report to be included with the permit-to-install. This report shall at a minimum include:

1. Sufficient hydrogeologic information to allow the Director to:

    a. identify and characterize the hydrogeology of the first continuous significant zone of saturation underlying the facility and all geologic strata that exists above that zone; and

    b. sufficiently characterize the site geology to allow for the evaluation of the proposed design of the facility and to ensure that it will comply with the requirements of Ohio Revised Code (ORC) 6111.

2. A description, based on publicly available information, of the hydrogeology within 2000 feet of the proposed facility. This shall include, but may not be limited to:

    a. the identification of all aquifer systems used as water supplies within 2000 feet of the facility; and

    b. the well logs of public and private water supply wells within 2000 feet of the proposed facility; and

    c. the average yield of water supply wells within 2000 feet of the facility; and

    d. the direction of ground water flow in the aquifer system(s) used as water supply sources within 2000 feet of the facility; and

    e. the identification of recharge and discharge areas of the aquifer system(s) used as water supply sources within 2000 feet of the facility; and

    f. the identification of any public water supply wells within 2000 feet of the facility; and

    g. regional stratigraphy, geomorphology and structural geology.

3. A detailed description, including the presentation of cross sections, of the hydrogeology under the proposed facility. This description shall be based on data collected from boreholes, piezometers, and test pits. The description shall include but may not be limited to:

    a. A description of the consolidated and unconsolidated deposits forming stratigraphic units from the ground surface down to the base of the first continuous significant zone of saturation underlying the facility including:

        i. Sedimentary composition for unconsolidated formations including:

            a. Textural classification: ASTM version of Unified Soil Classification System - USCS; and

            b. Atterberg limits; and

            c. Grain size distribution (sieve and hydrometer curves for representative samples of each group of borings of similar soil composition); and

            d. Hydraulic conductivity; and

ii. thickness; and

iii. lateral extent; and

b. A description of the geomorphology at the proposed facility; and

c. A description of the first continuous significant zone of saturation underlying the facility and all significant zones of saturation above the first continuous significant zone of saturation underlying the facility. This description shall include the depth to, and lateral and vertical extent of the first continuous significant zone of saturation to extend completely beneath the facility. This description shall include but not be limited to:

i. Temporal fluctuations in ground water levels and the effects on ground water flow directions;

ii. An interpretation of the ground water flow system, including rate of flow, direction of flow, vertical and lateral components of flow, and interconnections between and within significant zones of saturation to extend completely beneath the facility. This interpretation shall be described in both narrative and map form;

iii. Identification and characterization of recharge and discharge areas within the boundaries of the proposed facility. This shall include any relationships of ground water with seeps, springs, streams and other surface water features; and

iv. A quantification of the vertical and horizontal hydraulic conductivity of the first continuous significant zone of saturation underlying the facility and all significant zones of saturation above the first continuous significant zone of saturation underlying the facility.

4. A detailed description of:

a. The drilling and soil sampling methods used in characterizing the soil and hydrogeologic properties of any unconsolidated and consolidated rock material underlying the proposed facility; and

b. The analytical procedures and methodology used to characterize the soil and rock materials obtained from test pits and borings;

c. The methodology, equipment, and procedures used to define the uppermost aquifer system and all significant zones of saturation above the uppermost aquifer system including:

i. Well and piezometer construction specifications; and

ii. Water level measurement procedures.

d. The methodology, equipment, and procedures used to determine the groundwater quality (if determined) in any significant zone of saturation including:

i. Detection of immiscible layers; and

ii. Collection of ground water samples, including:

a. Well evacuation;

b. Sample withdrawal;

c. Sample containers and handling; and

d. Sample preservation.

iii. Performance of field analysis, including:

a. Procedures and forms for recording data and the exact location, time, and facility-specific considerations associated with the data acquisition; and

b. Calibration of field devices; and

iv. Decontamination of equipment; and

v. Analysis of ground water samples; and

vi. Chain of custody control, including:

a. Standardized field tracking reporting forms to record sample custody in the field prior to and during shipment; and

b. Prepared sample labels containing all information necessary for effective sample tracking; and

vii. Field and laboratory quality assurance and quality control including:

a. collection of replicate samples; and

b. Submission of field-bias blanks; and

c. Potential interferences.

5. All boring logs, test pit logs, ground water quality data, soil analytical data, and any other data generated while preparing this report.

The Division of Drinking and Ground Waters (DDAGW) has performed a preliminary hydrogeologic site evaluation for a site located in _____ county (see Figure 1). This site is being evaluated as to its potential to be used for locating a _____ and the request for the evaluation was made by _____. The limitations to this use of the site are contained in the attached worksheet. The information and comments contained in the worksheet are based on geologic information available to the DDAGW when the evaluation was performed. As such, these comments may be subject to change as additional information becomes available.

If the above entity desires to continue developing the evaluated site, it is recommended that a work plan be submitted to you describing the methods that will be used to gather the information needed for the hydrogeologic site investigation report. Attachment I is included to assist the entity in producing a work plan. A work plan is recommended so the DDAGW can comment on the proposed field work prior to it occurring. This assists the applicant in assuring all the information needed to process any resulting permit-to-install application is produced. These comments do not mandate specific action to be implemented by the entity, but only provide guidance in an effort to assist the entity to comply with applicable standards. The entity should notify Ohio EPA of the intent to implement any field work prior to its commencement so Ohio EPA may observe if necessary.

If you have any questions, please call me at _____.

pc: John J. Sadzewicz, Chief, DDAGW
Tom Allen, Assistant Chief, DDAGW
File

PRELIMINARY SITE EVALUATION
WORK SHEET

NOTICE: THE INFORMATION AND COMMENTS CONTAINED IN THIS WORKSHEET ARE BASED ON GEOLOGIC INFORMATION AND DATA AVAILABLE TO THE DIVISION OF DRINKING AND GROUND WATERS WHEN THE EVALUATION WAS PERFORMED. AS SUCH, THESE COMMENTS MAY BE SUBJECT TO CHANGE AS ADDITIONAL INFORMATION BECOMES AVAILABLE.

ENTITY REQUESTING EVALUATION: _____

MAILING ADDRESS: _____

_____

ENTITY REPRESENTATIVE: _____ PHONE NUMBER: _____

DATE EVALUATION PERFORMED:_____ TYPE OF FACILITY BEING CONSIDERED:_____

PERSONNEL PRESENT DURING SITE EVALUATION: _____

_____

SITE LOCATION: (USGS QUADRANGLE MAP SHOWING LOCATION OF SITE SHOULD BE ATTACHED TO THIS WORK SHEET)

COUNTY: _____ USGS QUAD: _____ TOWNSHIP/RANGE LOCATION: _____

GENERAL SITE CHARACTERISTICS: (Reference and list all sources used):

1. CURRENT AND/ OR RELAVANT LAND USE (Including adjacent land use):

2. REGULATED UNITS OR/NEAR THE SITE INCLUDING POTENTIAL GROUND WATER IMPACTS:

   _____

3. SOIL TYPE AND CHARACTERISTICS:_____

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4. GEOMORPHOLOGY: _____

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5. GEOLOGIC STRATIGRAPHY: _____

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6. GROUND WATER USE IN AREA: _____

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7. REGIONAL AQUIFER: _____

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8. GROUND WATER FLOW DIRECTION: _____

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9. GROUND WATER RECHARGE AND DISCHARGE AREAS NEAR SITE: _____

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10. OTHER RELEVANT INFORMATION: _____

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SITING LIMITATIONS: THE EVALUATOR SHOULD NOTE WHICH SITING CRITERIA OR OTHER LIMITATIONS MAY BE RELEVANT TO THE SITE BEING EVALUATED. THE SITE LIMITATION SHOULD BE IN REFERENCE TO THE POTENTIAL FOR GROUND WATER CONTAMINATION OCCURING IF THE PROPOSED FACILITY IS LOCATED AT THE SITE EVALUATED AND ANY APPROPRIATE SITING REQUIREMENTS WHICH MAY APPLY TO THE PROPOSED FACILITY. THE EVALUATOR SHOULD COMMENT ON WHY THE LIMITATION APPLIES TO THE EVALUATED SITE AND THE NEED FOR ADDITIONAL INFORMATION TO ADDRESS THE SITE LIMITATION. NO CONJECTURES SHALL BE MADE AS TO THE APPROVABILITY OF THE SITE WITH REGARDS TO ANY POTENTIAL PERMIT APPLICATION.

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