

STANTON PARK SHORE EROSION CONTROL PROTECTION



Request for Qualifications

December 2011

STANTON PARK SHORE EROSION CONTROL PROTECTION PLAN

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NOTE: With the exception of Exhibit H below, the full version of Reference Documents are available to view at www.lakecountyohio.gov/engineer under "Projects"

- Exhibit A: Lake County Coastal Development Plan, pages 38 & 39
Lake County Planning Commission, January 2005
- Exhibit B: Aerial Photography
- Exhibit C: C.Y.O. Camp "As-Built" Site Plan
Construction Management Consultants Inc., 9 June 1988
- Exhibit D: Stanton Park Shoreline, Existing Site Plan
Matrix Engineering, 19 August 2005
- Exhibit E: Stanton Park Survey Monument Data Sheet
Lake County Engineer
- Exhibit F: Stanton Park Bathymetric Survey
JJR, LLC, 2 November 2009
- Exhibit G: Excerpts from a Thesis Entitled, "The Influences Of Groundwater On Bluff Erosion At Bill Stanton Community Park, Lake County, Ohio"
by Jennifer L. Vagen, University of Toledo, May 2003
- Exhibit H: Excerpt from a Sample Formal Shoreline/Sand Monitoring Program
from ACE Shoreline Permit; Special Conditions



Madison Township

Request for Qualifications

STANTON PARK SHORE EROSION CONTROL PROTECTION PLAN

Madison Township, Ohio's largest township, publicly holds the 35 acre Stanton Park. Stanton Park has 1,100 feet of shoreline on the shores of Lake Erie. The park is identified in the 2005 Lake County Coastal Development Plan as a key, publicly owned parcel which with proper planning, design and investment would result in a Lake County Coast Line that is more accessible, economically viable and locally relevant.

The Stanton Park shoreline along Lake Erie has been slowly eroding away, creating a difficult and dangerous area for park visitors who want to access the lake shore. The shoreline needs to be protected.

To address this need, Madison Township has received Congressional Discretionary Funding to prepare a shore protection plan for the portion of the park affected by wave and runoff erosion. The plan will provide a design that satisfies all coastal permitting and will position the park for further upland development in order to provide greater utility and public access to Lake Erie.

NOVEMBER 2011

TOWNSHIP TRUSTEES

**Peter Wayman, Clerk Pro Tempore
William Brotzman, Chairman
Max Anderson Jr., Co-Chairman**

Larry Advey, Township Administrator

Legal Notice

**Request for Statement of Qualifications for Design Services
Madison Township Trustees
Lake County, Ohio**

Stanton Park Shore Erosion Control Protection Plan (PID xxxx)

Pursuant to Ohio Revised Code Sections 307.86 and 9.33 to 9.333, Notice is hereby given to any interested firm providing Design Services that the Madison Township Board of Trustees is seeking qualification statements for Design Services for Stanton Park Shore Erosion Control Protection, Madison Township, OH described below:

Stanton Park has 35 acres and 1,100 feet of Lake Erie Shoreline. The purpose of the project is to design a plan that will protect the shoreline by the creation/protection of a public beach and bluff stabilization by mitigating surface runoff and groundwater erosion. The plan will integrate with and serve as a foundation for future land-side improvements at the park.

The designer will provide plans, permits, cost estimates, and bid documents. The project may also require 401 Water Quality Certification from the Ohio Environmental Protection Agency. The successful consultant must be ODOT pre-qualified and demonstrate knowledge of the requirements of the USACE and ODNR permitting process and shoreline design requirements.

Questions should be directed to:

Bruce Landeg, P.E., P.S.
Project Manager
440.350.2770
Bruce.Landeg@lakecountyohio.gov

A detailed Project Description, Scope and Requirements of Letters of Interest can be found under the "Legal Notices" section entitled *Stanton Park Shore Erosion Control Protection – Design Services*. Documents can also be obtained at the office of James R. Gills, P.E., P.S., Lake County Engineer, 550 Blackbrook Road, Painesville, Ohio 44077.

Qualification Statements for Design Services for Stanton Park Shore Erosion Control Protection shall be received at the Lake County Engineer's Office at the above address no later than 4:30pm on [Day], [Month], 2011.

BY ORDER OF THE BOARD OF MADISON TOWNSHIP TRUSTEES, Lake County, Ohio.

TOWNSHIP TRUSTEES
Peter Wayman, Clerk Pro Tempore
William Brotzman, Chairman
Max Anderson Jr., Co-Chairman

Larry Advey, Township Administrator

Publish: The News Herald
 Day, Month, 2011
 ODOT Website

Public Agency Authority and Responsibility

Madison Township obtained a TEA-21 OH062 Earmark for preliminary engineering and construction of a shore protection project. On October 14, 2010, the Board of Lake County Commissioners adopted Resolution (20101014\E05) (E7) authorizing the Lake County Engineer to sponsor and apply to the NOACA Transportation Plan for the Stanton Park Shore Erosion Control Protection project in Madison Township, Ohio. Madison Township has spent approximately \$1.8 million total between two land acquisitions for greenway enhancement, utilizing the TEA-21 Earmark. Madison Township wants to use the remainder of the earmark to do the shoreline protection work. The project was approved by the NOACA Governing Board on May 13, 2011 via Resolution No. 2011-020.

Project Background

In 2001, Lake County began the process of developing a Coastal Development Plan. The result of this effort was the development of the Lake County Coastal Development Plan (CDP), a Conceptual Master Plan and a Focus Area Plan. The Coastal Development Plan identified seven publicly owned locations along the County's 27 mile shoreline that provided opportunities for development. Public ownership was considered a key to success as an acquisition issue would be eliminated and resources could be devoted to needed improvements, not legal proceedings. Stanton Park in Madison Township was chosen as one of the seven sites considered critical due to its potential development opportunities in the event that necessary shoreline protections and other public infrastructure improvements were completed (Exhibit A).

Stanton Park is owned by the Township and consists of 35 acres (Exhibit B). Stanton Park has 1,100 feet of shoreline, 1,100 feet of road frontage and several buildings as well as an in-ground pool and all public utilities. Prior to acquisition by Madison Township, the property was owned by the Catholic Diocese and used as a retreat center. More recently, the Township has leased out the chapel and community hall for weddings and other special events. Several structures on the site were used to house participants in retreat activities, but are not considered useable at this time.

In addition, the Park sits on a bluff approximately 50 feet above Lake Erie. This bluff is subject to erosion caused by surface runoff and groundwater seepage while the beach is subject to wave-driven erosion.

In April of 2009, Madison Township solicited proposals for parties interested in developing Stanton Park in a manner consistent with the 2005 Coastal Development Plan.

Therefore, the development of a shore protection plan for the coastal portion of Stanton Park will serve to ensure the Park's long-term viability. The Plan will: 1) analyze the existing conditions; 2) mitigate surface water runoff erosion from the bluffs. The plan will utilize sustainable design principles and maintain a balance between promoting the ecological health of the natural areas and improving beach access to park visitors.

Project Description

Purpose & Need:

The 2008 Lake Erie Protection and Restoration Plan noted that land use change along the Lake Erie shoreline over the past several decades has been significant, particularly in two areas: the conversion of greenspace to urbanized land use and the fact that only 13% of the entire Ohio shoreline is accessible to the public. Therefore, preserving and enhancing shoreline parks such as Stanton Park, is essential to ensure the conservation of greenspace in densely developed areas and the provision of direct public access to Lake Erie.

The purpose of the project is to design a plan that will protect the Lake Erie shoreline from erosion and establish a beach along Stanton Park in Madison Township, Lake County, Ohio. Three types of bluff protection have been considered: a stepped approach; a continuous slope; and do nothing. The various ideas have been discussed with the Ohio Department of Natural Resources (ODNR). Considering the need for a publicly accessible shoreline, Madison Township is aggressively pursuing a shore-land protection project as detailed in this RFQ.

Madison Township had an existing site plan of the near-shore areas prepared by Matrix Engineering in 2005. A copy of the plan is included in this RFQ (Exhibit D).

The completion of the Stanton Park Shore Erosion Control Protection will serve as a foundation for contemplated future land-side improvements at the Park. Cost estimates provided for the approved shoreline improvements will guide the Township in seeking and leveraging additional construction funding through grants and programs.

General Scope of Work

Madison Township is seeking a consultant or team of consultants to provide preliminary and final professional engineering services to prepare the Stanton Park Shore Erosion Control Protection Plan.

The consultant will plan and attend one or more pre-application meetings, as required. Meeting attendees to include, at a minimum: OCM, OEPA, USACE and the applicant.

Services are to include: shore structure design, permitting, and submerged land leases (as required) and a Consistency Statement from permitting agencies. All field work (survey and geotechnical) and design work for proposed major elements such as: segmented breakwaters, revetment of shoreline, beach nourishment, and/or site and grading plans are to be included in the deliverables. The successful consultant or consulting team shall take the project from preliminary engineering, through detailed design and permitting, up to bidding of the project for construction. The detailed plan can be categorized into the following two major components of shoreline erosion control: Beach Creation/Protection and Bluff Stabilization.

These components will evaluate shoreline stability along the 1,100 foot long beach and develop a new design to create, protect and enhance the beach area. In addition, the plan will focus on mitigating erosion in the northeast corner of the site where existing and potential bluff failure must be stabilized. The two components are further detailed below:

Beach Creation/Protection

- a) Specific elements to be addressed in the beach protection portion of the design include:
- Evaluate alternatives and prepare a design and cost estimate(s) for an erosion protected beach system. For example, segmented breakwater designs in shallow near-shore areas may prove feasible for reducing wave energy, arresting erosion and creating a beach area. Improvements to also consider ADA accessibility and swimming safety (including life guarding stations).
 - Recent ACE permits detail a complex and costly shoreline/sand monitoring system. A typical special condition excerpt section for a recent, detached, breakwater project is attached (Exhibit H). The designer is to produce a plan that will substantially mitigate and/or account for these cumbersome and costly monitoring conditions.
 - Shore improvements that have a positive, littoral impact on adjacent properties.
 - Prepare a public involvement plan that 1) embraces the adjacent property owner via communication, cooperation and coordination; 2) supports the proposed public involvement activities shown on the proposed timetable in the following section.
 - Permitting, submerged land leases and a Consistency Statement from permitting agencies as required.

Bluff Stabilization

- b) Specific elements to be addressed in the bluff stabilization portion of this design include:
- Work limits: within the easterly and westerly property boundaries, work limits begin 500' southerly (from the 7/13/2005 shoreline as shown on Exhibit D) and extend into Lake Erie as far as the proposed beach protection plan requires. A balanced cut-fill site is economically desirable or alternatively a proposed off-site haul location may be considered for construction spoils based on the cost benefits.
 - Upland site plan to stabilize the bluff based on mitigating the major erosion stressors including but not limited to slope, ground water and surface water. Surface water and runoff recommendations may include modification or reductions to parking and storm water management techniques appropriate to the soil conditions. Existing and potential bluff failure as evidenced in the northeast corner of the site must be stabilized. Revetment along the shoreline, if required is also part of the bluff stabilization scope.
 - Conduct additional geotechnical investigation and granular analysis of existing soils, required. Determine the long-term stable slope terracing and the suitability of onsite granular excavating for possible use in beach nourishment. See Exhibit D and Exhibit G for existing monitoring well locations.
 - Analyze the specific location of the beach area in relation to other features along the land-side and develop a preferred scenario for a breakwater system to sustain a stable beach area for swimming activities.
 - Fill material (groins depicted in 1954, seawall present in 1973, concrete cone modules evident in 1980, concrete rubble present in 2003) has been artificially placed along the Lake Erie shoreline and has altered the location of the natural shoreline. All occupation, current and future, will require a submerged lands lease from the state of Ohio. It is suggested that the consultant selected work with ODNR, Coastal Management to identify all areas of existing fill. Structures constructed after the effective date of the shore Structure Permitting Authority (1955) that control erosion, wave action or inundation along the shore of Lake Erie require authorization through the issuance of a Shore Structure Permit. Existing unauthorized structures require after-the-fact authorization.
 - Demolition plan for all structures to be removed and utilities to be abandoned within the project grading and work limits.
 - Storm Water Pollution Prevention Plan (SWP3) to be designed and submitted by Consultant.

Public Participation

Public participation will be an important component of the process. Meetings with a Technical Advisory Committee comprised of local stakeholders including Madison Township, Lake County Engineer, Lake County Planning Commission, Coastal Planning Committee, Lake County Port Authority, Rabbit Run Community Arts Association, Lake County Soil and Water Conservation District, Ohio Department of Natural Resources (ODNR), Ohio Department of Transportation (ODOT), and others will be held on a regular basis throughout the planning process. In addition, two public meetings will be held on site to provide the opportunity for public input at specific intervals.

Project Outcome and Deliverables

The consultant team shall prepare a Shore Erosion Control Protection Plan for the portion of Stanton Park defined in the Scope of Work. The development of this plan will ensure that the park will continue to provide public access for future generations.

The Shore Erosion Control Protection Plan will address two technical components:

- Beach Creation/Protection
- Bluff Stabilization

Public involvement is a third component; also to be accomplished by the Consultant.

Deliverables shall include combinations of reports, specifications, maps/plans and required authorizations generally described as follows:

- **Reports** are to be a narrative with corresponding graphics, such as charts, tables, photos and maps that illustrate the existing conditions, opportunities and constraints. Provide an estimate of fees for authorizations during the planning phase of the project. Each component may be prepared individually, or integrated with composite maps, possibly with the use of overlays (10 hard copies) at the 50% submission. The report, is also to be delivered in Microsoft Word® and/or Access® format on CD (2 copies).
- **Progress Maps/Plans** with narrative summaries are to be prepared for each stakeholder and public meeting. Ten original copies of each map in hard copy are to be delivered to the Lake County Engineer prior to each meeting. Ten original copies of the final plan for each component shall also be delivered on CD. Additional copies of the final plan are to be delivered to Advisory Committee members. A final plan map of the Project Area Work Limits will be provided in AutoCAD® 2008.
- **A Summary of Public Meeting Comments**, concerns and discussion from the technical advisory and public meetings are to be prepared in a report format and included in the final report.
- **Final Plan Bid Documents**, along with detailed opinions of probable construction costs, should be included in the final submission. Permits, maps, tables and lists are to be delivered in hard copy (10 copies) and in AutoCAD® 2008, Microsoft Word® and/or Access® format on CD (2 copies). Any tables and lists are to be in a format that can be updated periodically as the project is implemented.
- **Required Authorizations**, including, but not limited to permitting, submerged land leases and a Consistency Statement from permitting agencies.

The following outlines the key events and deliverables for the project. Completion of the key event timetable blanks is part of the submission for each consultant team along with proposed technical milestones.

Deliverable	
Project start up Identify Advisory Committee Set meeting schedule for Technical Advisory Committee Set Public Meeting Schedule Estimated Delivery Date _____	
Key Events	Public Involvement
The Consultant will plan and attend one or more pre-application meetings, as required. Attendees to include (at a minimum) OCM, OEPA, USACE and the Applicant. Estimated Delivery Date _____	Pre-application Meetings
Evaluation & Update of Existing Conditions/Geotechnical Investigation and Survey Estimated Delivery Date _____	Stakeholder/TAC Meeting
50% Review Submission Estimated Delivery Date _____	
First Public Meeting Estimated Delivery Date _____	
90% Review Submission Estimated Delivery Date _____	
Second Public Meeting Estimated Delivery Date _____	Stakeholder/TAC Meeting
Final Site, Facility and Public Access Plan Estimated Delivery Date _____	ODNR, ACE, Public Agency Approvals, Consistency Statement and Support of any Public Agency Driven Comment Periods/Meetings

Consultant Qualifications

Consultant or consultant teams responding should have previous experience in each of the areas of the study including coastal engineering, slope stability, sustainable design, recreational facility evaluation & planning, public involvement, and working with governmental agencies (specifically ODNR and ACE) or other similar organizations. Consultants should have successfully completed similar projects.

Additionally the consultant must be ODOT prequalified on this project.

- See Attached for ODOT Consultant pre-qualifications.

RFQ Submission Requirements and Evaluation

Consultants interested in being considered for a contract to provide the requested services should reply with five (5) copies in the attached Letter of Interest (LOI) format on _____, 2011 to Bruce Landeg, P.E., P.S., Chief Deputy Engineer, Lake County Engineer, 550 Blackbrook Road, Painesville, Ohio 44077.

The proposals will be reviewed and interviews will be conducted by a Qualification Based Selection (QBS) Committee comprised of Madison Township, Lake County Engineer, Lake County Planning Commission, and Lake County Port Authority staff and possibly ODNR/ODOT. The selection committee will review and screen the proposals with a focus on areas shown on the enclosed "Consultant Selection Rating Form".

A more detailed scope of work and level of effort will be finalized with the consultant/consultant team deemed to be most qualified. After any adjustments are mutually agreed upon, and a fee is negotiated, a recommendation will be presented to the Madison Township Trustees to authorize a Professional Services Agreement.

Information Contacts

The following individuals are available as information contacts regarding this RFQ. Questions or inquiries should be submitted in writing, and responses will be forwarded, in writing, to all potential submitters. Neither Lake County nor Madison Township will be responsible for any oral instructions.

Project Manager:	<u>Bruce Landeg, P.E., P.S., Chief Deputy Engineer</u> Lake County Engineer 550 Blackbrook Road Painesville, Ohio 44077 440.350.2770 Bruce.Landeg@lakecountyohio.gov
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STANTON PARK SHORE EROSION CONTROL PROTECTION PLAN
MADISON TOWNSHIP, OHIO
REQUEST FOR QUALIFICATIONS
RESPONSE DATE: _____

REQUIREMENTS FOR THE LETTER OF INTEREST

A. General Instructions for Preparing and Submitting a Letter of Interest

1. Provide the information requested in hardcopy in the Letter of Interest Format (Item B below), in the same order listed, and an original letter signed by an officer of the firm. Do not send additional forms, resumes, brochures, or other material.
2. Letters of Interest shall be limited to ten (10) single-sided pages.
3. Please adhere to the following in preparing and binding letters of interest:
 - a. Provide a minimum of one and one half (1.5) inch top margin on all sheets.
 - b. Page numbers must be centered at the bottom of each page.
 - c. Use eight and one half (8.5) inch by eleven (11) inch bond weight paper only.
 - d. Bind letters of interest by stapling at the upper left-hand corner only. Do not utilize any other binding system.
 - e. Do not provide tabbed inserts or other features that may interfere with machine copying.
4. Faxed copies will not be accepted.
5. Letters of Interest must be received by 4:30 pm EST on the due date.

B. Letter of Interest Format

1. List the types of services for which your firm is currently pre-qualified by ODOT, OEPA, USACE and ODNR. List significant sub consultants, their current pre-qualification categories, and the percentage of work to be performed by each sub consultant.
2. List the Project Manager and other key staff members, including key sub consultant staff. Include breakout of project engineers, inspectors and other staff members that will be responsible for the project. Also indicate the number of such personnel available for assignment to this project.
3. Provide a representative listing of projects similar in scope and size to the proposed project that has been performed by the firm.
4. Briefly describe the experience of personnel within the firm on similar projects.
5. Briefly describe the technical capability within the firm as a precursor to your specific technical approach in no. 7.
6. List the present workload of the firm relative to capacity and availability to provide requested services.
7. Describe the technical project approach to completing this project.

Selection sub-factors: Thorough understanding of ODNR's and ACE's permitting process and Consistency Statement. Familiarity with ODNR's Coastal Design Manual.

Project Approach as detailed in L.O.I.

Interested firms should submit Letters of Interest by _____.

Stanton Park Shore Erosion Control Protection Plan

Consultant Selection Rating Form

Name of Construction
Management Firm:

Criteria	Rating	Weight	Score
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I. PERSONNEL AND FACILITIES

Qualifications of project manager

	1.5	
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Description of assigned staff, facilities, and geographic location of these for the project

	1.5	
--	-----	--

Anticipated services of sub-consultants

	1.5	
--	-----	--

II. EXPERIENCE

Firm's past performance working with the Lake County Engineer and/or ACE/ODNR agencies

	1.0	
--	-----	--

ODOT OEPA, USACE & ODNR
Prequalification, MBE/DBE participation etc.

	1.0	
--	-----	--

Firm's experience with similar projects, **include references**

	1.0	
--	-----	--

III. TEAM CAPABILITY

Discuss technical ability to perform this project with an emphasis on your project approach and ideas

	2.0	
--	-----	--

Present workload of staff relative to this project

	1.0	
--	-----	--

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TOTAL

Rating Key: 2=Poor, 4=Fair, 6=Good, 8=Excellent, 10=Superior

North Perry Village/Madison Township



Joint oblique of preferred concept

Existing Site Conditions

This project site is located near the boundary between North Perry Village and Madison Township. Townline Park in North Perry Village forms the west edge of the project. Stanton Park in Madison Township forms the east boundary. The area in between the two parks is made up of private residences. The project area encompasses approximately one mile of coastline.

Conditions along the one-mile of shoreline vary between naturally stable beaches and slopes to unprotected eroding slopes. Townline Park is a semipublic village park with an unsafe boat launch. A narrow sand beach is situated at the bottom of relatively stable vegetated slopes east of the boat launch area. Stanton Park is a public township park with a need for some bluff stabilization and possibly an improved access route to the water. A narrow beach at the base of relatively stable, vegetated bluffs is located along the western portion of the park. The private shoreline between the two parks contains a combination of treated and

untreated shoreline and slopes that appear to be relatively stable with the exception of one small stretch of eroding bluff. The beach at the base of the bluff ranges between narrow to nonexistent. A variety of different concrete protection structures have been placed along this reach of shoreline in an effort to break wave energy and maintain the beaches.

Development Program

The initial intent for the Townline and Stanton Parks was to locate a harbor of refuge basin between Geneva State Park and Fairport Harbor. This included the repair and replacement of the existing boat launch at Townline Park, and stabilization of the failing slope at Stanton Park. More recent strategies included the idea of placing offshore barrier structures to protect the shoreline and create substantial recreational boating and swimming beaches in the area between the two parks as part of an integrated safe harbor and passive recreation waterfront design.

Specific Design Parameters and Technical Issues

The NOAA bathymetric data used for this study indicates a very flat offshore profile resulting in relatively shallow water several hundred feet out from the shoreline. This may have significant implications in terms of recreational boating draft requirements, initial project dredging, and maintenance dredging. A more detailed site specific bathymetric survey and coastal wind/wave analysis will be required and may result in adjustments to the final design scheme as shown in this document.

Specific design parameters and technical issues that will have to be addressed for the development of this waterfront area include:

- water depths at the harbor of refuge/marina;
- littoral drift and potential sand deposition in the harbor entrance area;
- regulatory agency permitting for placement of protective offshore structures and for filling of the lakebed;
- and land use agreements between the Lake County/Madison Township and private landowners.

Conceptual Design

The concept shown in this report includes a series of offshore breakwaters and beaches, and a small harbor area that will:

- provide safe harbor for recreational boaters, anglers, and small commercial vessels;
- restore, enhance, and protect the shoreline and bluffs from erosive wave action;



- provide waterfront access and recreational beaches for swimmers and sunbathers; and
- create potential coastal wetland zones for enhanced fish and wildlife habitat.

The beach forms shown are a result of the location of the breakwater and the type and nature of the beach material used to "fill" the beach cells. The beach shape will change slightly in response to storm events. Highlights and elements of this concept that are part of the Opinion of Probable Construction Costs include:

- a protected harbor for recreational water craft;
- small marina with dockage for approximately 40 boats;
- new boat launch within the protected harbor;
- supporting marina infrastructure including driveways and parking, water and electrical utilities, deicing system;
- waterfront access and sand beaches for recreation and fishing;
- slope stabilization at Stanton Park;
- scenic overlook structures at both Towline and Stanton Park.

Summary of Opinion of Probable Construction Costs

A. Towline Park - (West)	
1 Demolition and Site Preparation	\$ 150,000
2 Land-Based Site Improvements	\$ 767,000
3 Water-Based Site Improvements	\$ 5,227,000
Total	\$ 6,144,000
B. Madison Township Private Prop. - (Central)	
1 Demolition and Site Preparation	\$ 95,000
2 Land-Based Site Improvements	\$ -
3 Water-Based Site Improvements	\$ 4,500,000
Total	\$ 4,595,000
C. Stanton Park - (East)	
1 Demolition and Site Preparation	\$ 95,000
2 Land-Based Site Improvements	\$ 323,000
3 Water-Based Site Improvements	\$ 1,750,000
Total	\$ 2,868,000

Notes/Assumptions:

1. All costs in 2004 dollars.
2. The site is a clean, non-contaminated site, ready for construction.
3. Does not include improvements to existing breakwaters or seawalls, or dock edges.
4. For planning and costing purposes, dockage assumes 10' head piers, 5' wide finger piers, and 40' long slips.
5. Marina basin dredged to 6' or greater navigable water to support boat dockage.
6. Bluffs above beaches will remain stable after placement of breakwaters and beaches.

7. Pedestrian access assumes 5% ADA down 40' bluff.
8. Final breakwater/revetment/sheepile design and engineering will require appropriate geotechnical and hydraulic analysis.
9. Opinion of Probable Construction Cost does not include the 25% conceptual design contingency or 10% design and engineering fees.





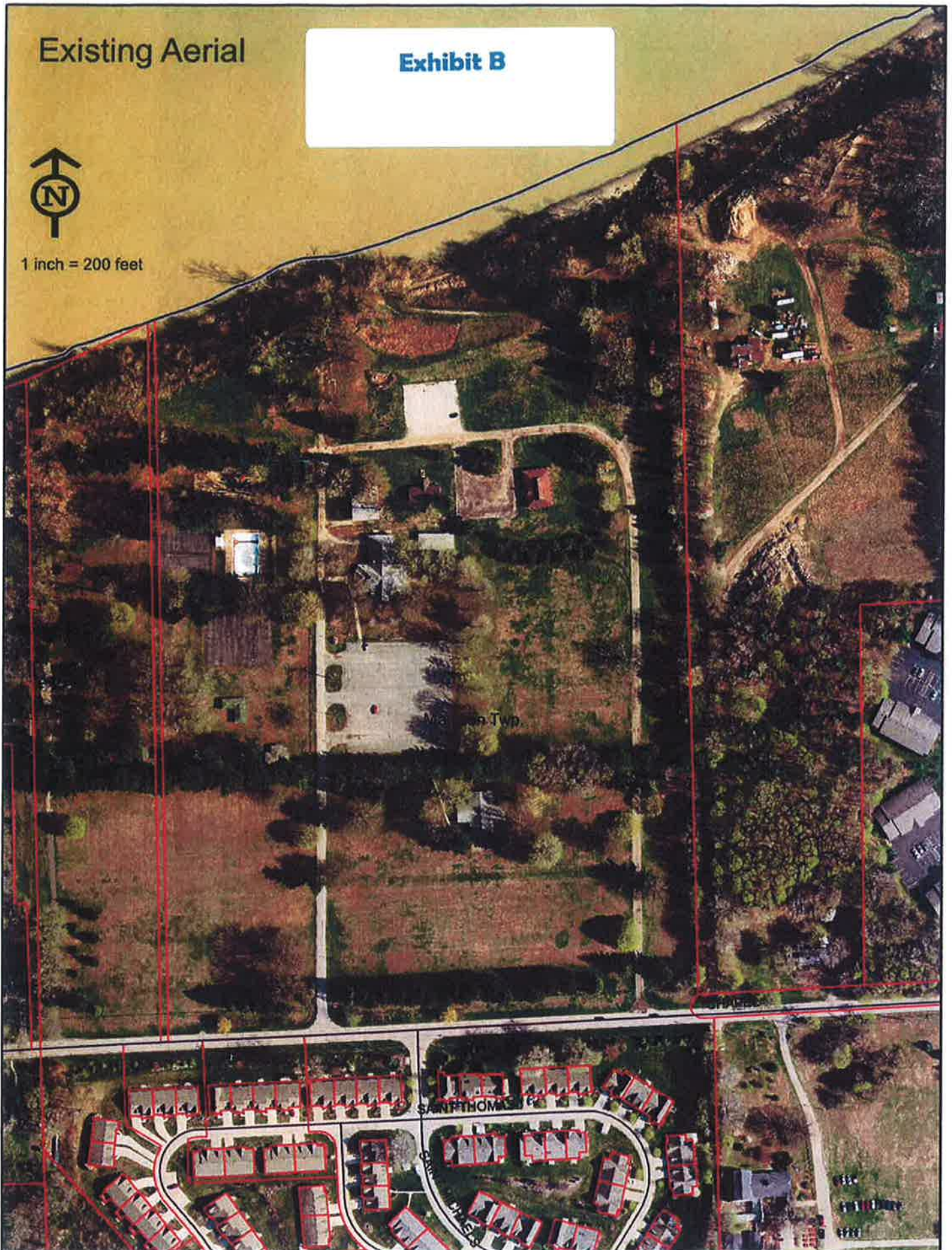
Exhibit B

Existing Aerial

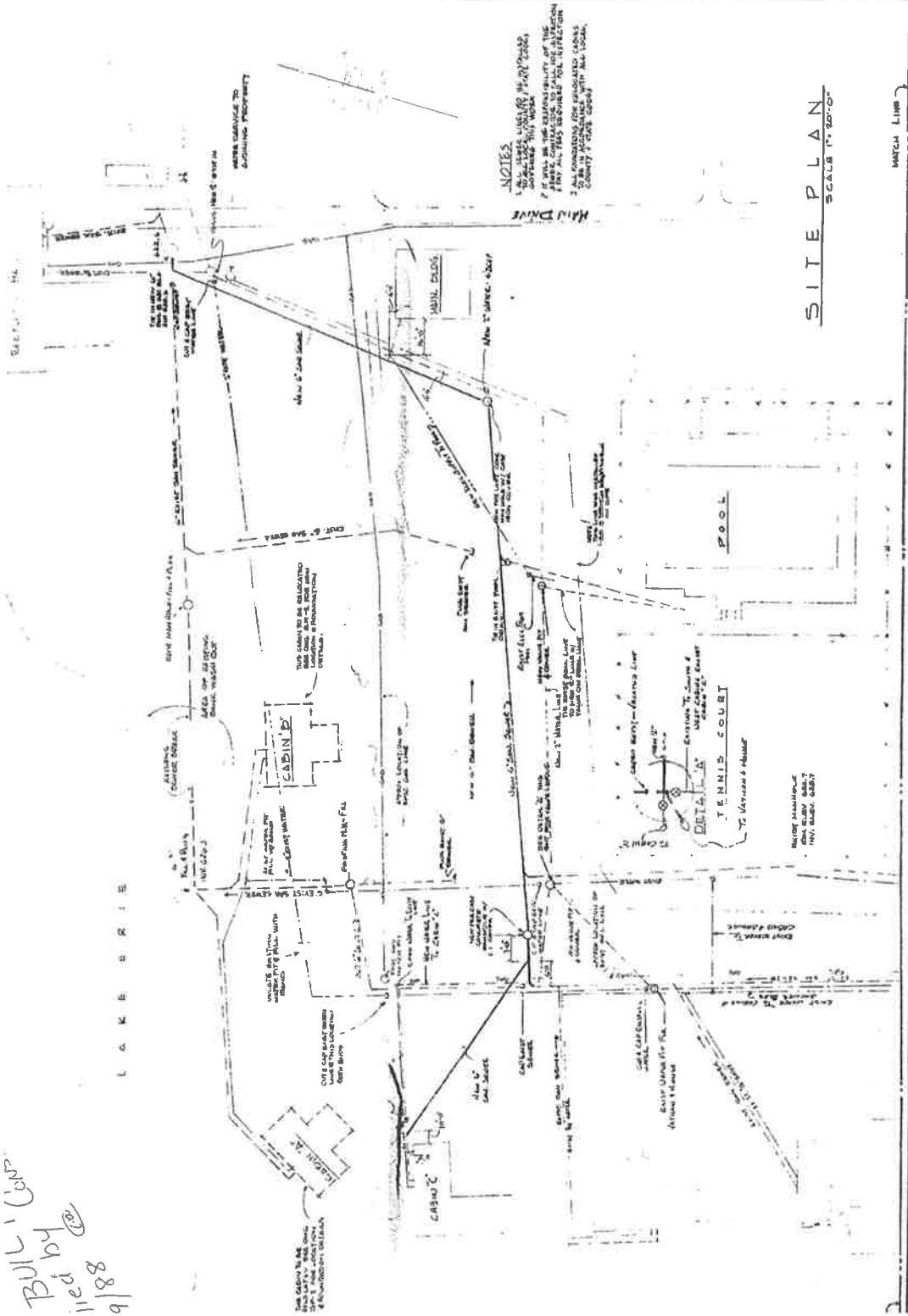
Exhibit B



1 inch = 200 feet



BULL' CORP
 11/88
 9/88



NOTES
 1. ALL CHANGES MUST BE MADE BY 10/1/88
 2. ALL CHANGES MUST BE MADE BY 10/1/88
 3. ALL CHANGES MUST BE MADE BY 10/1/88
 4. ALL CHANGES MUST BE MADE BY 10/1/88
 5. ALL CHANGES MUST BE MADE BY 10/1/88
 6. ALL CHANGES MUST BE MADE BY 10/1/88
 7. ALL CHANGES MUST BE MADE BY 10/1/88
 8. ALL CHANGES MUST BE MADE BY 10/1/88
 9. ALL CHANGES MUST BE MADE BY 10/1/88
 10. ALL CHANGES MUST BE MADE BY 10/1/88

SITE PLAN
 SCALE 1"=50'-0"

MARCH 1988

C.Y.O. CAMP 5505 CHAPEL ROAD MADISON OHIO CATHOLIC CHARITIES CLEVELAND OHIO	
Construction Management Consultants, Inc. 1441 Buckeye Avenue Cleveland, Ohio 44117 CHM 001414	Date: 9-15-88 By: BOP Project: RELOCATION SITE PLAN 6/1/88



COUNTY OF LAKE
JAMES R. GILLS, P.E., P.S.
 LAKE COUNTY ENGINEER

OFFICE OF THE
 LAKE COUNTY ENGINEER
 550 BLACKBROOK ROAD
 PAINESVILLE, OHIO 44077

POINT # 3087 MADISON TOWNSHIP, LAKE COUNTY, OHIO

SITE PICTURE



ORTHOGRAPHIC PHOTO



DESCRIPTION:
 LK CO MON

CONDITION:

LATITUDE: 41°49'21.49029"
LONGITUDE: 81°05'21.45023"

CONVERGENCE: 0°55'36"
SCALE FACTOR: 1.000025954

FEET

METERS

NORTH (sft.) 788611.776
EAST (sft.) 2353014.277
NAVD88 ELEV. (sft.) 631.276
ELLIPSOID HEIGHT
GEOID HEIGHT

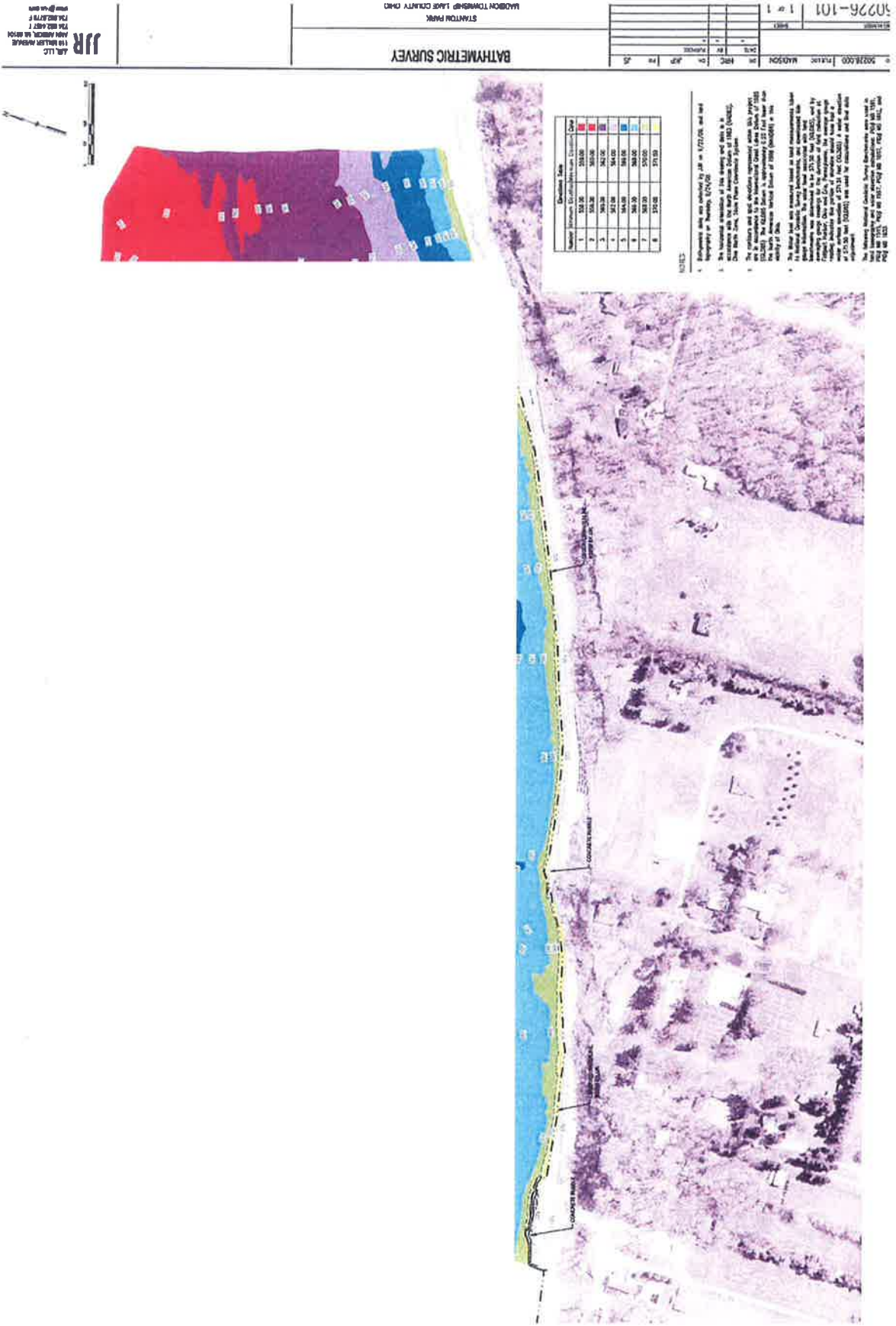
NORTH (m) 240369.350
EAST (m) 717200.186
NAVD88 ELEV. (m) 192.413

COMMENTS:

CARSONITE MARKER - GEOID 03 SET AND OBS. - 8/05 - 5/8" IRON PIN W/ 3" ALUMINUM CAP
 RINEX - 17372280.05o 000356922

Exhibit E

Exhibit F



Conclusion

A variety of coastal processes can assist a shoreline in combating erosion, for example, the accumulation of sand to form a beach. Many processes can also hinder a shoreline, like wave action tearing away a bluff face. These processes become more evident and more important when people live along a coastline and come in contact with it in their everyday lives. This is true of Bill Stanton Community Park. Officials and residents of Madison Township want to protect their park from further erosion and preserve it for the future. Speculation existed as to the exact cause for the erosion of the bluff face, and this paper may help officials decide what means to take in slowing erosion at the Park.

The objectives of this research were to determine whether groundwater was an influential factor controlling bluff degradation at Stanton Park, to provide a detailed stratigraphic column of the materials which compose the bluff at Stanton Park, to compare Lake Erie water levels with groundwater levels, and to determine whether most erosion will take place in conjunction with seeps. A recommendation as to the most effective means of retarding erosion at Stanton Park is also made.

Groundwater fluctuations coincide with times of increased erosion and evidence of seeps. Groundwater increased in the late summer to fall months, and then decreased through winter, and then increased until the end of the study (late April, 2002). Seeps were observed in early spring when there was

increased erosion at the base of the bluff face. This erosion occurred in the same saturated zone as the seeps along the bluff face. Lower groundwater heads are also noted at this time because groundwater is discharging as seeps along the bluff.

During the time of this study, wave attack was very minimal to non-existent, except during times of storms, and lake levels never rose to the levels of the bluff. There was also a substantial beach in front of the bluff face during the study time. So, common factors of shoreline erosion, such as wave attack and rising lake levels, can be discounted at Stanton Park. Therefore, groundwater is likely the main factor controlling erosion at the park.

Man-made shore protection structures commonly used along Lake Erie include steel sheet piling sea walls, rip-rap revetments, offshore breakwaters, and shore perpendicular groins or jetties. These structures would not be very effective at Stanton Park if the groundwater is indeed the major cause of bluff erosion. A more effective means of slowing the erosion rate at the park would be to de-water the bluff.

Officials and residents of Madison Township also now have a detailed stratigraphic column of the sediments which compose the bluff and monitoring wells so groundwater can be monitored in the future. Composing a plan to de-water the bluff will be made simpler with these tools.

The hypothesis stated in the Introduction was, for the most part, supported from the research conducted. Groundwater was proven to be the most critical factor controlling bluff loss at Stanton Park, with other factors such as freeze and

thaw, wave action, and changing lake levels playing a role in initiating the slope failure. It is a combination of these influences which are the driving force behind slope erosion. De-watering the bluff was recommended as the most effective way of delaying erosion at the Park. A detailed stratigraphic column was provided in this paper. Most erosion occurring along the bluff face was observed where seeps were located. And finally, Lake Erie water levels were recorded and compared with groundwater levels.

The hypothesis that a correlation exists between changing lake levels and changing groundwater levels was proven to be false, though. Lake Erie water levels did not follow the same pattern as the groundwater levels, and there is no correlation between the two. This is due to the influence of precipitation in other, larger portions of the Lake Erie drainage basin on Lake Erie water levels. This means that the groundwater system controlling bluff erosion at Stanton Park is not tied into Lake Erie water levels.

Officials of Madison Township now have an educated direction to take in planning for their system to retard erosion at Stanton Park.

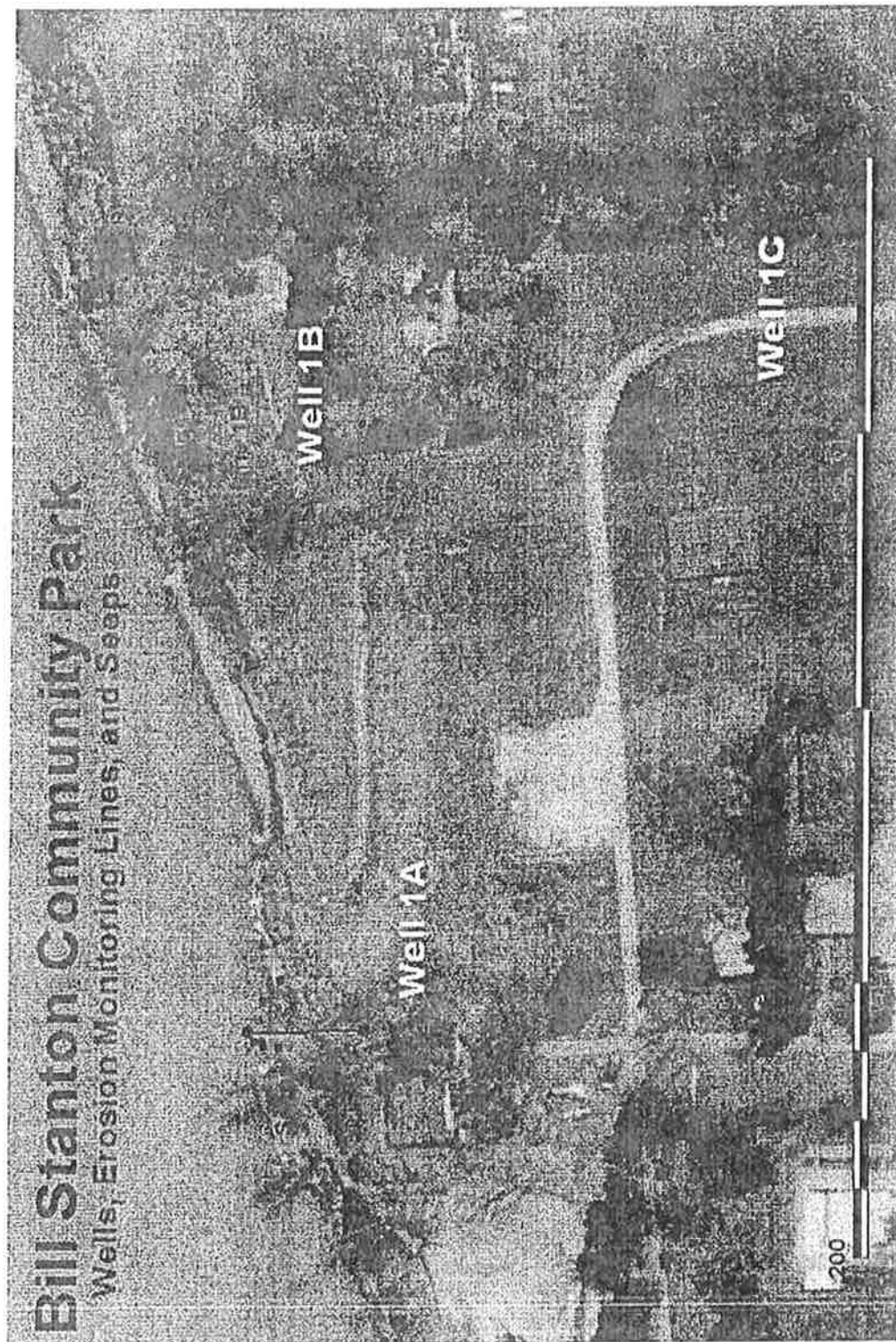
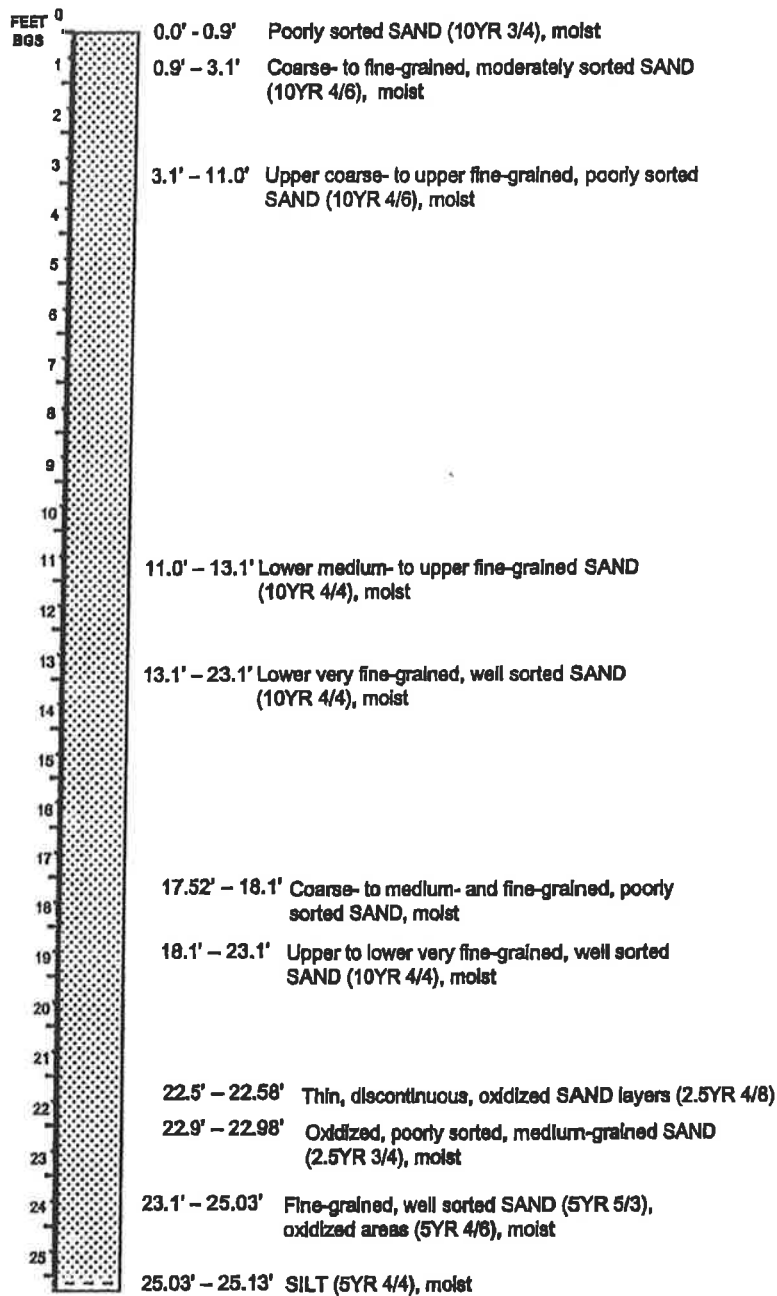


Figure 17. ArcView layout of well, seep, and line locations.

**Bill Stanton Park Coring and Monitoring Well Installation
Madison Township, Lake County, Ohio
Well 1A April 2, 2001**



Continued at Top of Next Page

STRATIGRAPHY LEGEND

- | | |
|---------------|---------------------------------------|
| Clay | Sand (and Silt) interbedded with Clay |
| Silt | Rock Fragments |
| Clay and Silt | Topsoil |
| Sand | Thin Clay layers |
| Sand and Silt | Big Root |

Figure 23. Well 1A borehole stratigraphy.

**Bill Stanton Park Coring and Monitoring Well Installation
Madison Township, Lake County, Ohio
Well 1A April 2, 2001**

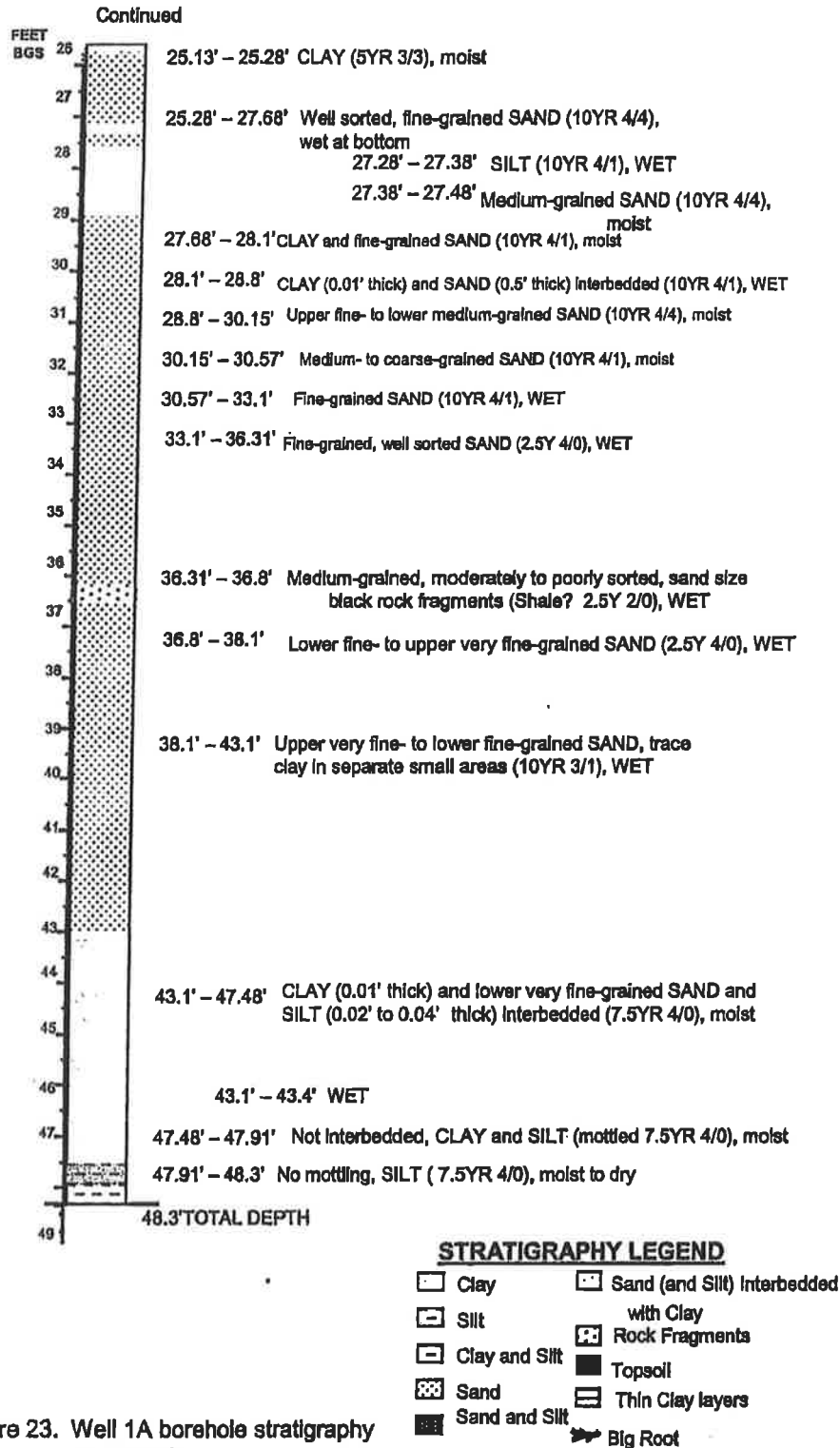


Figure 23. Well 1A borehole stratigraphy continued.

**Bill Stanton Park Coring and Monitoring Well
Installation
Madison Township, Lake County, Ohio
Well 1B April 4, 2001**

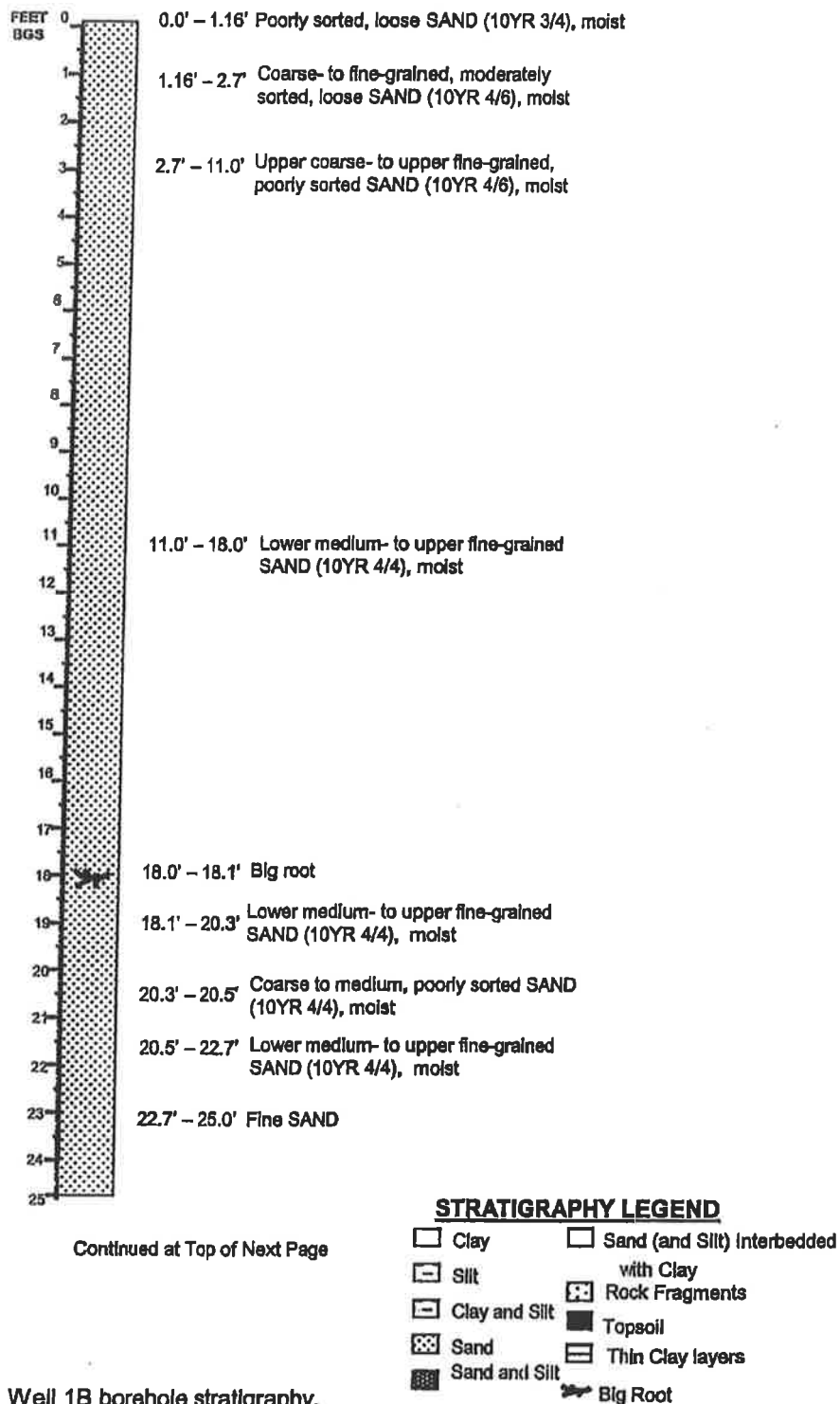


Figure 24. Well 1B borehole stratigraphy.

**Bill Stanton Park Coring and Monitoring Well
Installation
Madison Township, Lake County, Ohio
Well 1B April 4, 2001**

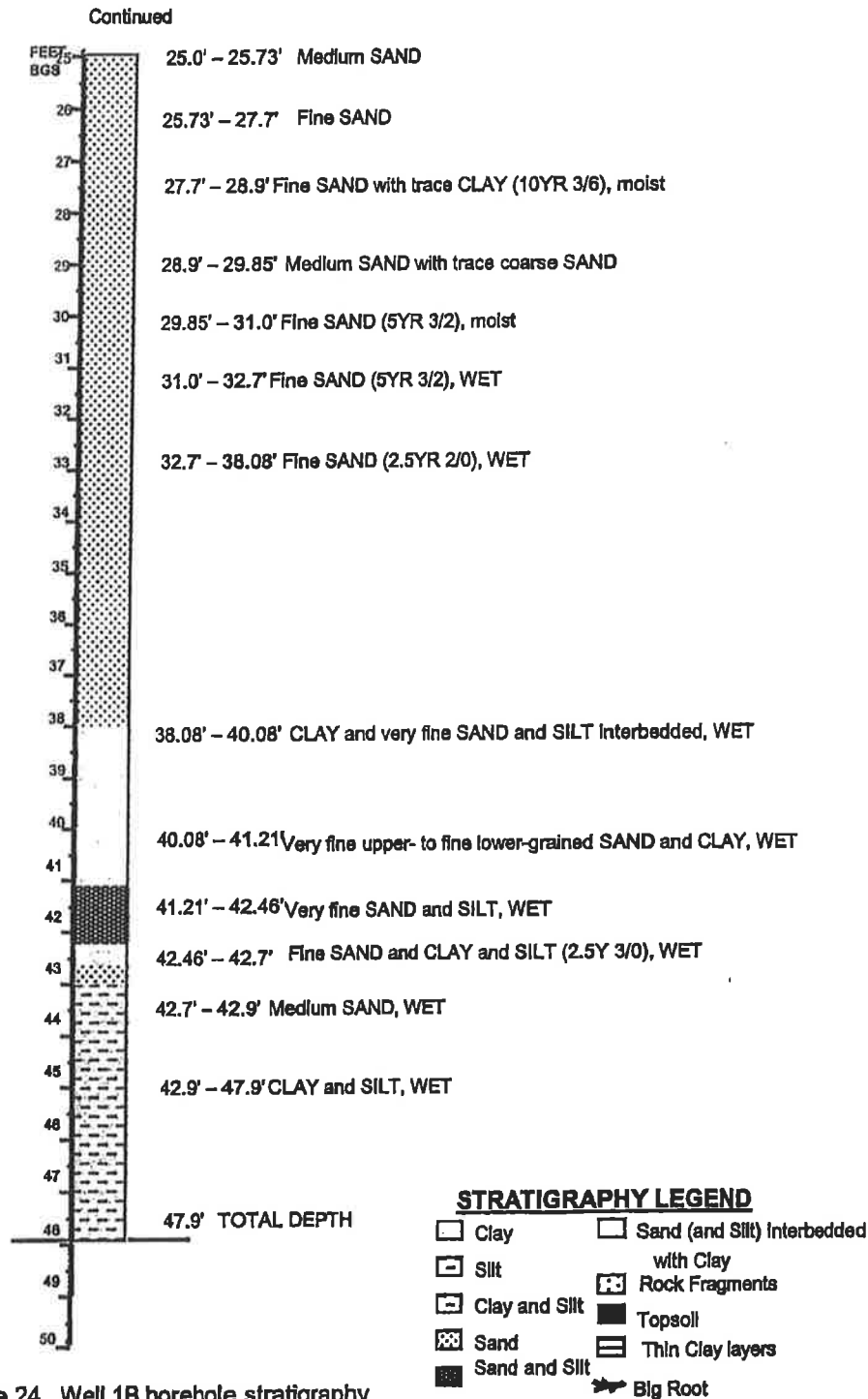


Figure 24. Well 1B borehole stratigraphy continued.

**Bill Stanton Park Coring and Monitoring Well
Installation
Madison Township, Lake County, Ohio
Well 1C April 5, 2001**

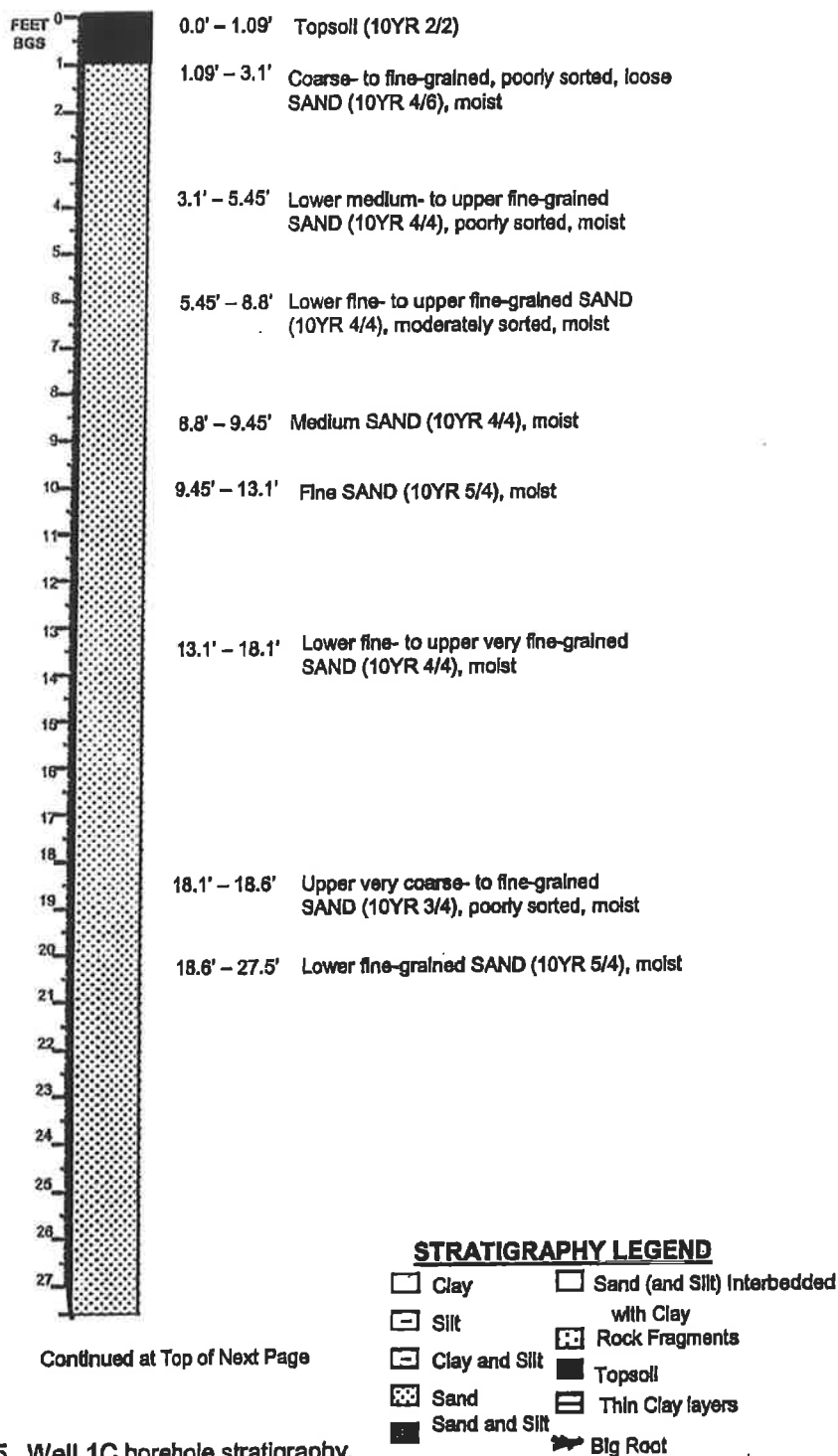


Figure 25. Well 1C borehole stratigraphy.

**Bill Stanton Park Coring and Monitoring Well
Installation
Madison Township, Lake County, Ohio
Well 1C April 5, 2001**

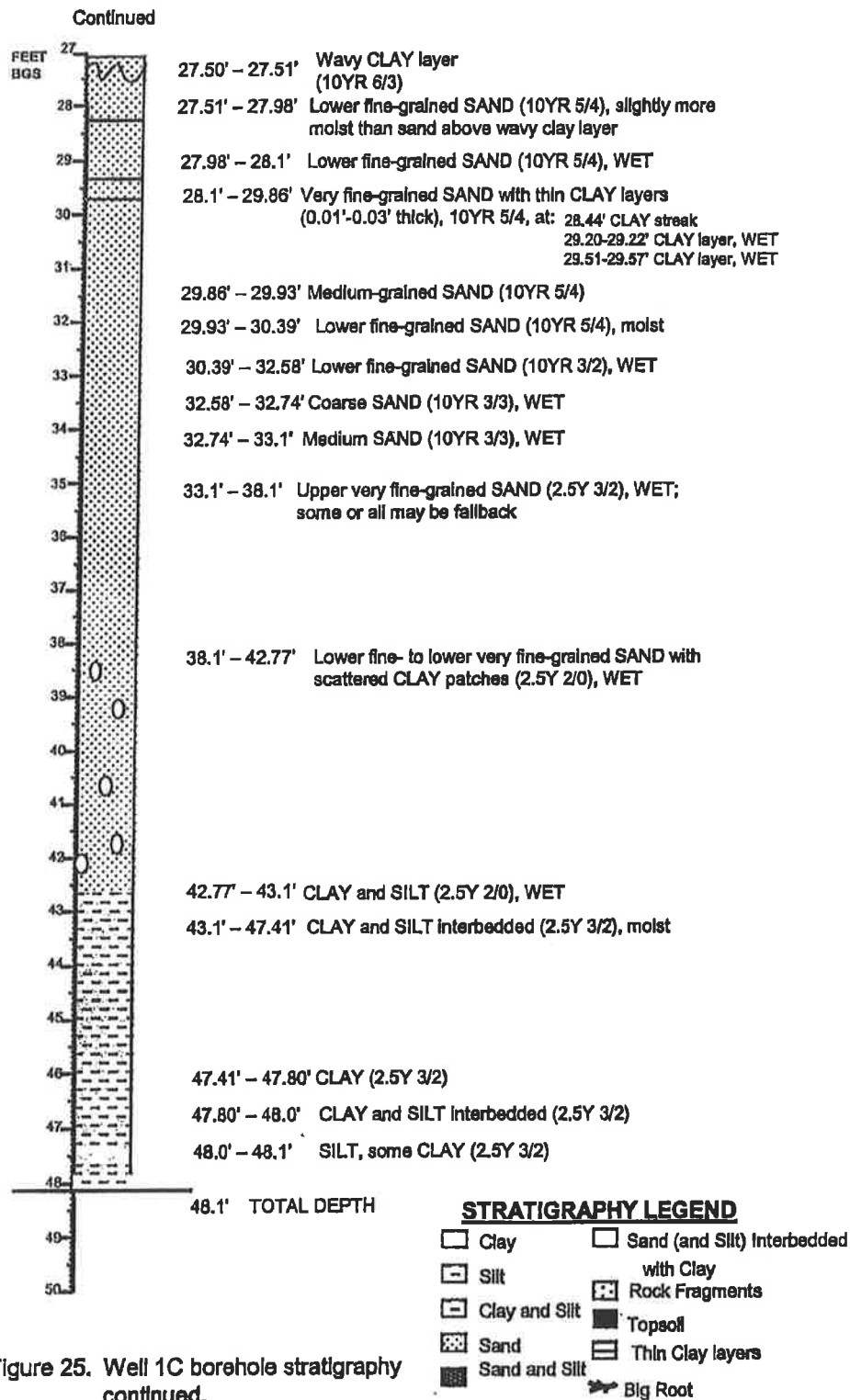


Figure 25. Well 1C borehole stratigraphy continued.

Well 1A Stratigraphy and Seep Comparison

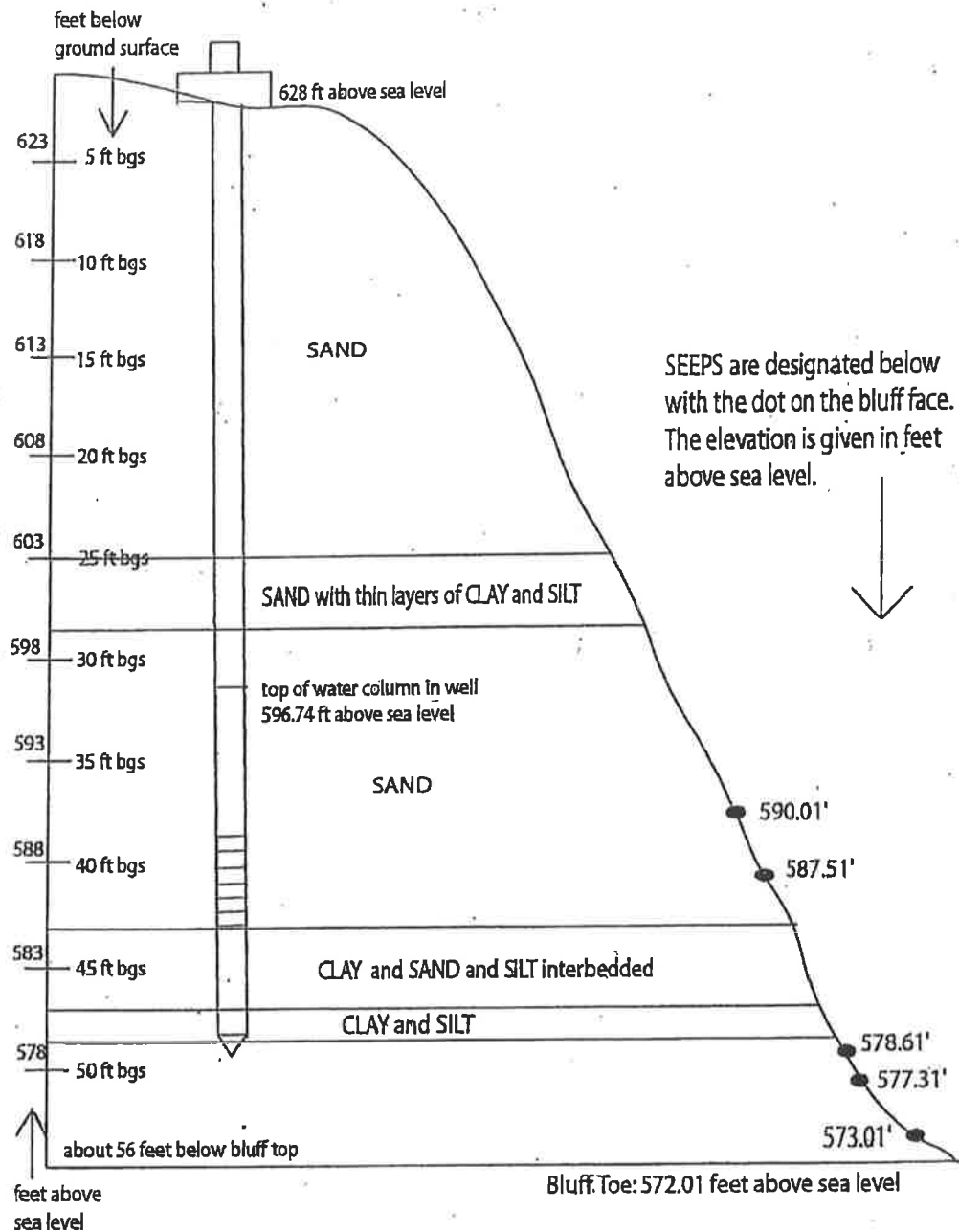


Figure 26. Diagram of Well 1A Stratigraphy and Seeps along bluff face.

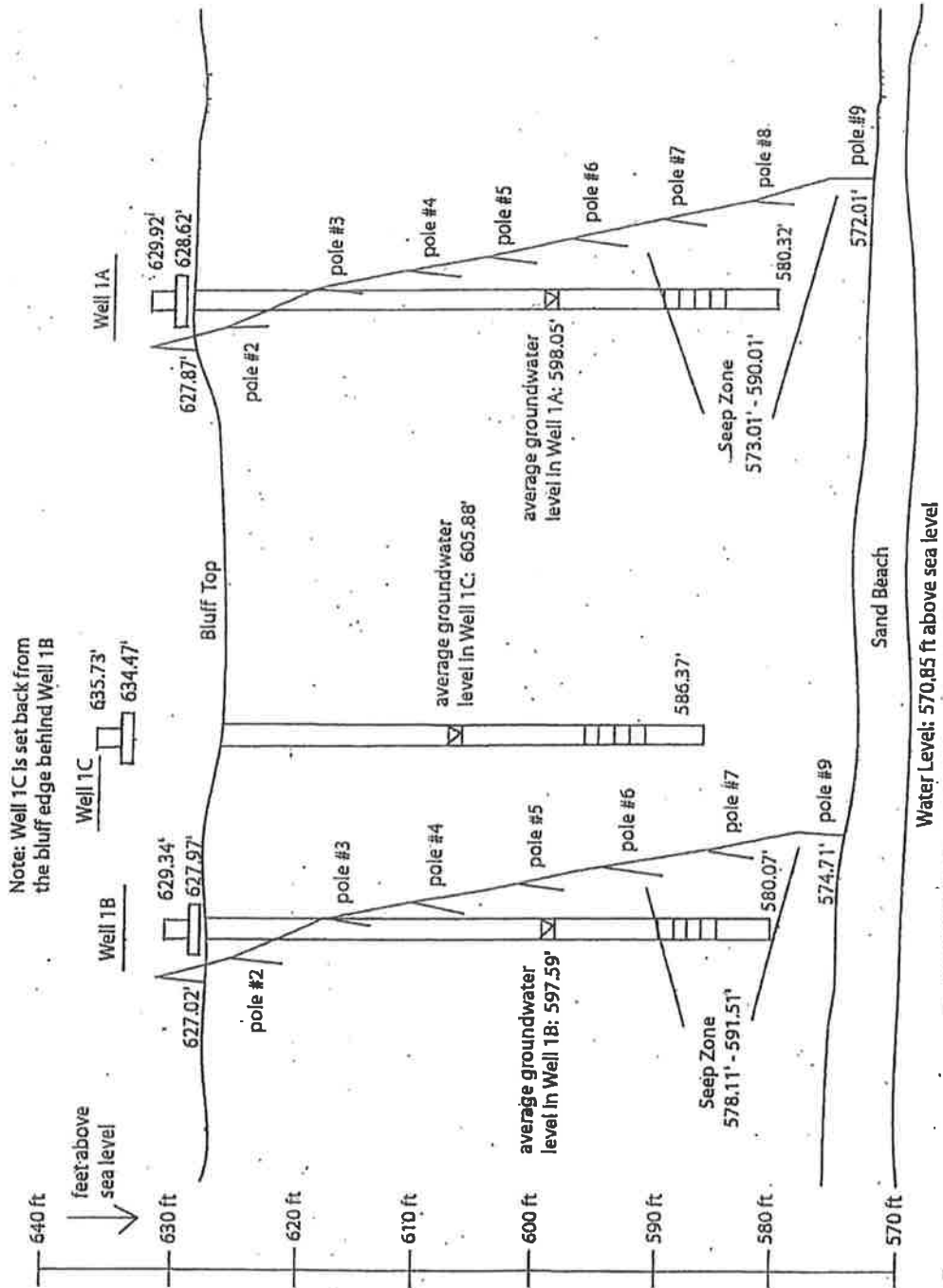


Figure 27. Diagram of the bluff at Bill Stanton Community Park. All measurements are in feet above sea level.

- 9) All erosion and sediment control practices shall be in place prior to any grading or filling operations and installation of proposed structures. They shall remain in place and be maintained until construction is completed and the area is stabilized.
- 10) That immediately following construction all exposed banks and slopes shall be seeded and mulched to prevent erosion.
- 11) All existing sand and gravel excavated during the removal of any structure or located below the footprint of any proposed structure must not be buried, or used as fill, but must be side cast lake ward in no more than 4 feet of water and down drift of the project area as depicted on Sheet 5a of 10, to prevent its removal from the littoral system. Side cast material should not exceed 2 foot above existing surface water level.
- 12) This permit was issued on your certification that the project is consistent with the Ohio Coastal Management Program policies pursuant to Section 1506.03 of the Ohio Revised Code. The Ohio Department of Natural Resources concurs in this certification provided you comply with any special conditions imposed by that agency. Noncompliance with any limitations or conditions stated in the certification may be a basis for suspension, revocation, or modification of this permit.
- 13) The Water Quality Certification issued for this project by the State of Ohio is part of this Department of the Army permit pursuant to Section 401(d) of the Clean Water Act. Noncompliance with any limitations or requirements stated in the certification may be a basis for suspension, revocation or modification of this permit.
- 14) You must install and maintain, at your expense, any safety lights and signals prescribed by the United States Coast Guard (USCG), through regulations or otherwise, at your authorized facilities. The USCG may be reached at the following address: Commander (oan), U.S. Coast Guard, Ninth Coast Guard District, 1240 East Ninth Street, Cleveland, Ohio 44199-2060, by telephone: (216) 902-6074, by FAX: (216) 902-6071, or by email: FRichter@uscg.mil
- 15) A formal shoreline/sand monitoring program is mandated to quantify the impoundment of sand both up drift and within the proposed structures footprint. This will establish and determine the appropriate amount of sand that will require bypassing to comply with the terms and conditions of this permit. The permittee is required to make and submit a detailed survey of the proposed project area PRIOR to any construction below OHW and then immediately after construction is completed. Surveys shall be conducted annually on the same date (or within 7 days) in June starting the year following construction. The survey report shall include:
 - a. Establishment of a survey point on the shoreline at an elevation of 573.4 IGLD that is in line with the center point of the middle breakwater. Establish transects approximately 750 feet up drift (west) and down drift (east) from the center survey point running parallel to the shoreline herein referred to as Up drift Transect and Down drift Transect (See Sheet 5a of 10). Establish additional transects perpendicular to the Up drift and down drift transects at 50-foot intervals and extend offshore out 250 feet to an approximate depth of about 8 – 10 feet of water. Once established, the same up drift and Downs drift transects should be used for each survey report.

- b. The existing lake level shall be determined and noted at the time of the survey.
- c. A table detailing each transect and the depth of the sand/bottom from the OHW taken at each sampling point along the given transect.
- d. The data collected from the survey shall be used to construct a digital elevation model. The model shall be developed by importing the data into a CAD like program to allow the generation of contours and to more accurately compare before and after project surveys. A detailed survey of the completed project area which satisfies the survey parameters detailed above shall be taken annually for years 1-10 after completion of construction. This requirement may be waived for years 6, 8 and 9 if, after the first five years it is determined the bypassing of sand is not necessary. These surveys shall be compared to the initial survey to determine if there has been sand accretion or erosion, and to the extent possible, quantify the cubic yardage of such accretion or erosion. Detailed survey measurements, accompanying analysis, and recommended bypass amounts must be submitted and received no later than annually July 1st to the attention U.S. Army Corps of Engineers, Chantelle Carroll, 33 Grand Valley Ave, Orwell, OH 44076.
- e. Once reports are received, the recommended amount of sand for bypassing will be determined by U.S. Army Corps of Engineers. The permittee shall remove trapped sediment and place it immediately down drift of the proposed project along the shoreline or in the near shore region at a depth of 4 feet or less. The permittee shall maximize the potential for the bypassed sand to remain in the littoral drift zone and minimize loss of sand in deeper water due to cross-shore transport.
- f. Following mandatory report Years 1 to 10 of the monitoring period (unless this requirement is waived for years 6, 8 and 9), if further action is necessary to maintain adequate littoral processes the Corps can order the Permittee to perform one or more of the following type of activities to include but not be limited to:
 - 1. Additional yearly monitoring or bypassing events
 - 2. Additional monitoring beyond 10 years
 - 3. Modification or removal of one or more of the detached offshore breakwaters
 - 4. Additional bypass of sand in order to maintain a distance greater than 15 feet between the toe of the south face of any detached offshore breakwater and the water elevation.
 - 5. Additional sand pre-fill.

16) In addition within the project limits the survey report shall include:

- a. The existing site conditions shall be photographed immediately following the completion of project construction and at the same approximate times in July as the above mentioned surveys for year 1 through 5, year 7, and year 10. Photographs shall be taken, at the same approximate location each year, and shall include but not limited to the following:

Photographs shall be taken near the edge of the top of the bluff facing water ward:

- i. At least one photograph at the west property boundary looking water ward.

- ii. At least one photograph (moving west to east) of each of the detached offshore breakwaters, for three photographs total.
- iii. Panoramic photograph(s) (or similar view as practicable) of the three breakwaters.
- iv. At least one photograph at the east property boundary looking water ward.
- v. At least one photograph from the eastern property line facing east, looking at the near shore area of the down drift properties.

Photographs shall be taken standing at the shoreline:

- i. At least one photograph from the center of the property shoreline looking west.
- ii. At least one photograph from the center of the property shoreline looking east.
- iii. At least one photograph from the eastern property shoreline facing east, looking at the down drift properties.

Photographs shall be taken from the detached offshore breakwaters facing shoreward:

- i. At least one photograph from the center of each detached offshore breakwater facing south toward the shoreline.
 - ii. At least three photographs from the eastern end of the eastern detached offshore breakwater facing south, south/southeast and southeast.
- b. If the distance between the center of the toe of the south face of any detached offshore breakwater and the water line on the day of the survey is less than 15 feet and/or the depth to sand is less than elevation 568 feet IGLD, sand shall be bypassed down-drift in the near shore waters (less than 4 feet deep). Sand bypassing shall be performed with a backhoe, front-end loader, excavator, or hydraulic pump in order to maintain the 15-foot gap. The sand shall be excavated to a depth of 568 IGLD. If a tombolo starts to form or has formed, it will need to be removed and the sand by-passed down drift.
- c. If the distance of open water between the south face of any detached offshore breakwater and shoreline as depicted in Sheets 5 of 10 through Sheet 7 of 10 is greater than the initial 65 feet +/- feet then the placement of additional sand pre-fill shall be performed as required to maintain the authorized 25 feet wide sand pre-fill area.
- 17) That at the request of an authorized representative of the Buffalo District, U.S. Army Corps of Engineers, you shall allow access to the project site to determine compliance with the conditions of this permit.
- 18) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
- 19) The permittee must provide documentation of establishment of a financial assurance mechanism for the survey, monitoring, and possible removal of the project through a

Corps approved method incorporating model language provided by the Corps or other language approved in writing by the Corps to be filed within 6 months of completion of project. The financial assurance mechanism must remain valid throughout the initial ten year monitoring to assure the continued bypassing of sand in the event if the property is sold or transferred or the project is determined to be unsuccessful.