



**BERLIN MAYOR AND COUNCIL**  
**Meeting Agenda**

**Berlin Town Hall**  
**10 William Street**  
**Monday, August 28, 2017**

**6:00 PM EXECUTIVE SESSION – Conference Room**

- a. Pursuant to Section §3-305(b)(7) – To consult with counsel to obtain legal advice on a legal matter.
- b. Pursuant to Section §3-305(b)(14) Before a contract is awarded or bids are opened, to discuss a matter directly related to a negotiating strategy or the contents of a bid or proposal, if public discussion or disclosure would adversely impact the ability of the public body to participate in the competitive bidding or proposal process.

**7:00 PM REGULAR SESSION – Council Chambers**

1. Approval of the Minutes for:
  - a. Executive Session of 08/14/17
  - b. Statement of Closure for Executive Session of 08/14/17
  - c. Regular Session of 08/14/17
2. Thank you to the volunteers at the Welcome Center – Economic and Community Development Director Ivy Wells
3. Special Event Request:
  - a. Reindeer Run – Saturday, December 2, 2017 8:00 AM – 11:00 AM – Lisa Long
  - b. Bark for Life – Sunday, November 5, 2017 12:00 PM – 5:00 PM – Dj Thompson
4. Police Department Phone System Contract – Police Chief Arnold Downing
5. Berlin Falls Park Reports – Town Administrator Laura Allen and Project Coordinator David Deutsch
6. Departmental Reports:
  - a. Finance Director – Natalie Saleh
  - b. Administrative Services Director – Mary Bohlen
  - c. Water Resources/Public Works – Jane Kreiter
  - d. Electric – Tim Lawrence
  - e. Chief – Arnold Downing
  - f. Planning – Dave Engelhart
  - g. Economic and Community Development – Ivy Wells
  - h. Managing Director – Jeff Fleetwood

7. Town Administrator's Report
8. Comments from the Mayor
9. Comments from the Council
10. Comments from the Public
11. Comments from the Press
12. Adjournment

Anyone having questions about the meetings mentioned above or needing special accommodations should contact Laura Allen, Town Administrator at (410) 641-4144. Written materials in alternate formats for persons with disabilities are made available upon request.

*TTY users dial 7-1-1 in the State of Maryland.  
TTY users outside Maryland dial 1-800-735-2258*



**BERLIN MAYOR AND COUNCIL**  
**Meeting Minutes**  
**Monday, August 14, 2017**

**7:00 PM            REGULAR SESSION – Berlin Town Hall Council Chambers**

**Present:** Mayor Gee Williams, Councilmembers Thom Gulyas, Zackery Tyndall, Dean Burrell, and Troy Purnell.

**Absent:** Vice-President Elroy Brittingham

**Staff Present:** Town Administrator Laura Allen, Administrative Services Director Mary Bohlen, Water Resources/Public Works Director Jane Kreiter, Police Chief Arnold Downing, Electric Utility Director Tim Lawrence, Planning Director Dave Engelhart, Economic and Community Development Director Ivy Wells, Town Attorney David Gaskill, and Administrative Assistant Kelsey Jensen.

Following the Lord’s Prayer and Pledge of Allegiance, Mayor Williams called the meeting to order at approximately 7:20 PM.

1. Approval of the Minutes for:
  - a. Regular Session of 07/24/17:

On the motion of Councilmember Gulyas, the Regular Session Minutes of July 24, 2017 were approved by the following vote:

Name	Counted toward Quorum			Recused	Absent
	Aye	No	Abstain		
Elroy Brittingham, VP					X
Dean Burrell	X				
Troy Purnell	X				
Thom Gulyas	X				
Zackery Tyndall	X				
<i>Voting Tally</i>	4				1

2. Berlin Bikeways Project – Planning Director Dave Engelhart
  - a. Motion 2017-22: Approval of the Memorandum of Understanding with the Maryland and Delaware Railroad

Planning and Zoning Director David Engelhart explained the Memorandum of Understanding in detail. Councilmember Gulyas asked what the licensing fee was for all three phases. Mayor Williams stated that it is \$12,559; Mr. Engelhart added that that would be for the entire 1.7 miles at \$.10 per square foot. Mayor Williams asked if the annual fee would be approximately \$3,000-\$4,000; Mr. Engelhart said it would. Councilmember Burrell mentioned that when we originally discussed this, we were planning to encompass the entire town, so what about including the east side of Town; Mr. Engelhart said that would be discussed with future funding, but he thought we could include that side by using the old railroads that the Town owns by the Power Plant. Mayor Williams and Councilmember Tyndall asked if we can check the easements to be sure it’s the Town’s property. Cam Bunting said that some of the property is owned by a private party. Mayor Williams asked for Mr. Engelhart to research the property ownership. Mr. Engelhart stated that until construction begins and areas are being paved, we only pay an annual total of \$1,500.

On the motion of Councilmember Tyndall, Motion 2017-22 was approved by the following vote:

Name	Counted toward Quorum			Recused	Absent
	Aye	No	Abstain		
Elroy Brittingham, VP					X
Dean Burrell	X				
Troy Purnell	X				
Thom Gulyas	X				
Zackery Tyndall	X				
<i>Voting Tally</i>	4				1

b. Motion 2017-23: Approval of the design and engineering proposal from DBF  
Mr. Engelhart explained DBF's proposal. Councilmember Burrell asked if we were responsible for the \$5,000 that the grant did not cover; Mr. Engelhart stated that we are.

On the motion of Councilmember Tyndall, Motion 2017-23 was approved by the following vote:

Name	Counted toward Quorum			Recused	Absent
	Aye	No	Abstain		
Elroy Brittingham, VP					X
Dean Burrell	X				
Troy Purnell	X				
Thom Gulyas	X				
Zackery Tyndall	X				
<i>Voting Tally</i>	4				1

3. Motion 2017-24: Approving Meeting Room Use Policy – Administrative Services Director Mary Bohlen

Administrative Services Director Mary Bohlen explained the room use policy. Councilmember Tyndall asked if this policy is like the Library's; she stated that it was. Cam Bunting asked for clarification on the cost; Mayor Williams explained that there is a high demand for the room and they wanted a standard policy in place. Cam Bunting asked if to make it clear we could strike the word organization in section 5b. Sara Hambury asked if there were limitations on the type of business that can be conducted in the meeting space; Ms. Bohlen said there was and when you fill out an application you indicate your intended use. Town Administrator Laura Allen stated that if approved the policy would go into effect on November 1, 2017, to give organizations time to adjust.

On the motion of Councilmember Gulyas, Motion 2017-24 with the effective date of November 1, 2017 and the change in section 5b was approved by the following vote:

Name	Counted toward Quorum			Recused	Absent
	Aye	No	Abstain		
Elroy Brittingham, VP					X
Dean Burrell	X				
Troy Purnell	X				
Thom Gulyas	X				
Zackery Tyndall	X				
<i>Voting Tally</i>	4				1

4. Motion 2017-25: Approving Community Parks and Playgrounds Grant Application for Permanent Restrooms in Stephen Decatur Park– Administrative Services Director Mary Bohlen

Administrative Services Director Mary Bohlen explained the grant application. Councilmember Burrell asked if our match portion could be in-kind; Ms. Bohlen stated that it could be, and likely would be.

On the motion of Councilmember Burrell, Motion 2017-25 was approved by the following vote:

Name	Counted toward Quorum			Recused	Absent
	Aye	No	Abstain		
Elroy Brittingham, VP					X
Dean Burrell	X				
Troy Purnell	X				
Thom Gulyas	X				
Zackery Tyndall	X				
<i>Voting Tally</i>	4				1

5. Motion 2017-26: Limiting parking on Jefferson St. to the east side and approving the installation of no parking signs on the west side – Police Chief Arnold Downing  
 Police Chief Arnold Downing explained the reasoning for limiting parking on Jefferson Street. Councilmember Tyndall asked if we would be painting the curbs red; Chief Downing said no, just posting signage. Councilmember Tyndall suggested we add some sort of visual aide to the signs like reflective tape or ribbons; Chief Downing said they can add ribbon for the first 30 days. Sara Hambury stated she would like to see it painted and would purchase the paint. Mayor Williams suggested starting with signage and if the problems persist then we can look into painting.

On the motion of Councilmember Burrell, Motion 2017-26 which will include a visual aide for 30 days was approved by the following vote:

Name	Counted toward Quorum			Recused	Absent
	Aye	No	Abstain		
Elroy Brittingham, VP					X
Dean Burrell	X				
Troy Purnell	X				
Thom Gulyas	X				
Zackery Tyndall	X				
<i>Voting Tally</i>	4				1

Councilmember Tyndall asked Water Resources/Public Works Director Jane Kreiter if we can also install visual aides on the signage at Buckingham Elementary for the first 30 days of school; she said she would.

6. Motion 2017- 27: Conditionally Approving a Subrecipient Agreement with Coastal Bays for the William Street Culvert Project – Town Administrator Laura Allen  
 Town Administrator Laura Allen stated that this item is no longer on the agenda because the funding is not available after the bid process, but Coastal Bays is looking into other ways to assist.
7. Departmental Reports:
  - a. Administrative Services Director – Mary Bohlen  
 Ms. Bohlen stated that there have been no movies in the park due to rain, but they will try to schedule some in September. She stated that Maryland Energy Administration Representatives will be here on Thursday\* to see the Maryland Smart Energy Project that was done in the

Welcome Center and the victorian street lights for lowered energy costs, to get our take on how the projects went.

\*Correction: The visit was scheduled for Wednesday the 16<sup>th</sup>. MTB

b. Water Resources/Public Works Director – Jane Kreiter

Ms. Kreiter stated that they plan on installing the split rail fence on the west side of Flower Street this week. They are also preparing to install the walk path from Flower Street to Cannery Village. West Street has been milled and they are waiting on better weather to do the matting and paving. She will also order the signs for Jefferson Street and visual aids.

c. Electric Utility Director – Tim Lawrence

Mr. Lawrence reported that they have completed the work at Intrepid Lane, they just need to add street lights. They also plan to add street lights on Schooner Lane. The seasonal help repainted the fuel tanks. The pumping systems in the Power Plant are working properly with all the rain. At Schooner Lane and Dueling Way, they will be undergrounding the overhead lines; Mayor Williams asked when they should be complete; he said probably late September. Lastly, he stated that the primary and transformer have been installed at the library.

d. Police Chief – Arnold Downing

Chief Downing thanked everyone for their help with National Night Out. On Wednesday, they will be taking children with Worcester Youth to Stratosphere Trampoline Park and Delmar Pizza, but could use more volunteers. Mayor Williams stated that he thought there was a great turnout at National Night Out. Lastly, he stated that they have installed CO2 detectors in all the Ford Explorers.

e. Planning and Zoning Director – David Engelhart

Mr. Engelhart had nothing to report.

f. Economic and Community Development Director – Ivy Wells

Ms. Wells stated that she needs all event requests by September 1<sup>st</sup>. She has begun working with John Fager on Small Town Throw Down, which will take place on September 9<sup>th</sup>. This Thursday County Grass will play at the lunchtime concert. She was invited to the Economic Roundtable meeting on Thursday and they will do a tour of Burley Oak too. Berlin Chamber of Commerce after hours is taking place at 6pm on Thursday, August 17<sup>th</sup> at Bruder Hill.

11. Town Administrator's Report – Laura Allen

Ms. Allen reported that she received questions about SHA's work on the sidewalks, they have moved over to do work on Seahawk Road, but will be coming back to complete the sidewalks. Chief Downing stated that they were back to working on the sidewalks today.

12. Comments from the Mayor:

Mayor Williams had no comments.

13. Comments from the Council:

Councilmember Gulyas asked Ms. Kreiter if there was a minimum height requirement for trees to grow over town roadways; she said she will check and get back to him.

Councilmember Tyndall stated that tomorrow is City Hall Selfie day and stated that they will take a group selfie at Town Hall at noon.

Councilmember Burrell stated that during the last rain event the culverts held up well. He also stated that the roads on Showell Street are really deteriorating and require attention.

Councilmember Purnell also agreed that the culverts are working well.

14. Comments from the Audience

Cam Bunting asked if the event policy changes are intended to limit the number of events in town; Mayor Williams stated that there have been complaints from merchants, issues with traffic, and events have been overlapping, so they are trying to plan better. Councilmember Tyndall said if they know about events ahead of time then staff can be more prepared. Ms. Wells stated that it was put in place to analyze events ahead of time, not necessary limit them; she added that there is a limit of six alcohol related events per year. Councilmember Tyndall said it also allows them more time to market events. Sara Hambury asked if Halloween is a Town event; Mayor Williams said it was not, but they are involved to be sure everyone is safe and respectful.

15. Comments from the Press – none.

16. Adjournment:

On the motion of Councilmember Burrell, the Mayor and Council meeting was adjourned at approximately 8:30PM.

Name	Counted toward Quorum			Recused	Absent
	Aye	No	Abstain		
Elroy Brittingham, VP					X
Dean Burrell	X				
Troy Purnell	X				
Thom Gulyas	X				
Zackery Tyndall	X				
<i>Voting Tally</i>	4				1

Respectfully Submitted,

Kelsey Jensen  
Administrative Assistant



SPECIAL EVENT  
TOWN STREET CLOSURE/REQUEST FOR SERVICES



This form must be completed in order to hold an event in the Town of Berlin on public streets or property. Additional documents from the Town of Berlin, or another entity, may be required. Please provide as much information as possible. Form must be signed and appropriate contact information provided to be considered. "Same as last year" will not be accepted for any category.

FORM MUST BE COMPLETED AND SUBMITTED:  
NO LESS THAN 60 DAYS IN ADVANCE OF THE EVENT IF STATE ROADS ARE TO BE CLOSED (SEE PAGE 2)  
NO LESS THAN 30 DAYS IN ADVANCE OF ANY OTHER EVENT

Today's Date: 3/2/17

Event Start time: 8<sup>00</sup> AM Road Closure Start: NA

Requested Date(s) of the event: 12/2/17

End time: 11<sup>00</sup> AM End: \_\_\_\_\_

Name of Event: Reindeer Run

Location of Event: The Atlantic Hotel  
\*If activity is in a Town park, a Parks Reservation form must be complete.

Estimated number of attendees: 300

Applicant Name: Lisa Rodriguez Long

Applicant Cell Phone: 443 614 4319

Sponsoring Organization or Business Name: Worcester Youth Family Services

Email: livealongfitness@live.com

Person(s) to Contact Day of Event: Name: Lisa R Long Cell # 443 614 4319  
Name: \_\_\_\_\_ Cell # \_\_\_\_\_

Description of event: 5K and 1 mile walk/run beginning at The Atlantic Hotel ending at Burley Oak

- The event sponsor hereby agrees to the following conditions:
1. The Town of Berlin, its representative(s) and/or agent(s) will be held harmless for any loss, damage, or liability incurred in connection with the event.
  2. The event sponsor is appropriately insured. Proof of insurance may be required; if the event sponsor does not possess the appropriate insurance, the Town of Berlin may require the purchase of one-time event insurance through the Town of Berlin's insurance carrier.
  3. The event sponsor will be responsible for any costs incurred by the Town as a result of damage done during the course of the event to Town-owned, rented, or leased properties.
  4. The event sponsor and/or its participating vendors are responsible for obtaining any licenses, permits, rights-of-way, etc. for the event, including any permits required by the Worcester County Health Department, the State Highway Administration or any other agencies as appropriate. Any fees or other conditions associated with such will be the sole responsibility of the event sponsor and/or its participating vendors.
  5. Activities must occur within the time frame(s) specified. It is the sponsoring organization's responsibility to ensure that vendors, performers, etc. do not set-up earlier than agreed, and will begin break-down of booths, equipment, etc. promptly. Vendors, etc. must be clear of the street/area within one hour of event ending. Private property remaining beyond one hour will be removed from the street.

By my signature below I identify myself as the representative of the above-named organization and/or the individual responsible for adherence to the conditions as set forth.

Signature: Lisa R Long Date: 3/2/17

Printed Name: Lisa R Long

Approved by the Mayor and Council on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_. For \_\_\_\_\_ Opposed \_\_\_\_\_ Abstain.



**DETAILS OF EVENT:**

Shaded areas for office use only

<b>Street Closure</b>		Note: Location map is required detailing streets to be blocked. Additionally, a State Highway Administration Request for Road Closure may be required.	
Will event require the closure of street(s)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Barricade locations must be marked on map.	
Blockage/Closure Time:	Start:	End:	If streets to be closed are Main Street, Bay Street, Broad Street, Old Ocean City Blvd., or William Street, for more than one hour, State Highway Administration Road Closure Form must be completed. State Highway Form submitted if applicable? <input type="checkbox"/>
Will on-street parking need to be cleared?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Notes: # of barricades _____	No-Parking signs to be placed: _____ Time/date
Will parking areas need to be cleared/closed?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Barricades to be dropped off: _____ Time/Date	Must be placed 24 hours prior to event.

<b>Electric</b>		Note: The Electric Department will assist with completion of Service Form.	
Will there be vendors or activities requiring access to electricity?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Request for Electric Service form required including information from each vendor/activity requiring electric. Request for Electric Form submitted? <input type="checkbox"/>	
Will there be banners to be hung?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, Request to Hang Banner form needed. Banner Form submitted? <input type="checkbox"/>	

<b>Other Items/Services:</b>		If applicable, items listed are in addition to those normally in place.	
Trash cans	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	# Required _____	Trash cans to be placed: _____ Time/date
Picnic Tables and/or Chairs	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	# Required _____	To be placed: _____ Time/date
Stage	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Location must be marked on map.	Stage to be placed: _____ Time/date Extensions needed: <input type="checkbox"/>
Temporary Fencing	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Location must be marked on map.	Fencing to be placed: _____ Time/date <input type="checkbox"/>
Porta-potties	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	# Standard <u>2</u> # Accessible <u>1</u>	Porta-potties will be placed in the alley on Pitts Street: _____ Time/date
Signs: Other than banners or parking	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Informational signs during the event not applicable.	Sign Permit may be required. Planning Office review _____ Date Sign Permit needed/submitted? <input type="checkbox"/>
Will there be vendors/individuals selling goods or services as part of the event?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Vendor's Application and Certification for Peddling and Soliciting will be required for EACH vendor participating in the event. If event/activity is in a municipal park a Business Use of Park Application will be required IN ADDITION to Vendor's Application and Certification for Peddling and Soliciting. Vendor's Permit(s) needed/submitted? <input type="checkbox"/>	

Additional Forms Required:	Yes	No	Date Rec'd	Initials
State Highway Administration Request for Road Closure		✓		
Park Reservation Application and Permit		✓		
Request for Electric Service		✓		
Request for Banner Placement		✓		
Sign Permit		✓		
Vendor's Application and Certification for Peddling and Soliciting		✓		
Business Use of Park Application		✓		
Proof of Insurance		✓		
Other:		✓		

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**Race Start:** Broad Street (in front of The Globe Restaurant)

Right on West Street

Right on Main Steet

Right on Buckingham Lane(1 mile Mark)

Right on West Street – Water Station (1 ½ mile Mark)

Right on Broad Street

Left on Main Street

Right on Old Ocean City Road

**Race Finish:** Burley Oak Brewery

**Lisa Rodriguez-Long**

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**SPECIAL EVENT  
TOWN STREET CLOSURE/REQUEST FOR SERVICES**



This form must be completed in order to hold an event in the Town of Berlin on public streets or property. Additional documents from the Town of Berlin, or another entity, may be required. Please provide as much information as possible. Form must be signed and appropriate contact information provided to be considered. "Same as last year" will not be accepted for any category.

**FORM MUST BE COMPLETED AND SUBMITTED:**

**NO LESS THAN 60 DAYS IN ADVANCE OF THE EVENT IF STATE ROADS ARE TO BE CLOSED (SEE PAGE 2)  
NO LESS THAN 30 DAYS IN ADVANCE OF ANY OTHER EVENT**

Today's Date: July 17, 2017

Event  
Start time: 12:00 p.m. Road Closure  
Start: None

Requested Date(s) of the event: Sunday, November 5, 2017

End time: 5:00 p.m. End: None

Name of Event: Bark For Life 2017

Location of Event: Stephen Decatur Park \*

Estimated number of attendees: \_\_\_\_\_

\*If activity is in a Town park, a Parks Reservation form must be complete.

Applicant Name: Dj Thompson

Applicant Cell Phone: 443-366-5440

Sponsoring Organization or Business Name:  
The American Cancer Society

Email: djthom421@gmail.com

Person(s) to Contact Day of Event: Name: Dj Thompson, Cell # 443-366-5440  
Name: Dawn Hodge, Cell # 443-497-1198

Description of event: The American Cancer Society Bark For Life is a fundraising event honoring the life-long contributions of our Canine Caregivers. It presents an opportunity for people to be empowered through their

canine companion partnerships and to contribute to cancer cures through the mission of the American Cancer Society.

The event sponsor hereby agrees to the following conditions:

1. The Town of Berlin, its representative(s) and/or agent(s) will be held harmless for any loss, damage, or liability incurred in connection with the event.
2. The event sponsor is appropriately insured. Proof of insurance may be required; if the event sponsor does not possess the appropriate insurance, the Town of Berlin may require the purchase of one-time event insurance through the Town of Berlin's insurance carrier.
3. The event sponsor will be responsible for any costs incurred by the Town as a result of damage done during the course of the event to Town-owned, rented, or leased properties.
4. The event sponsor and/or its participating vendors are responsible for obtaining any licenses, permits, rights-of-way, etc. for the event, including any permits required by the Worcester County Health Department, the State Highway Administration or any other agencies as appropriate. Any fees or other conditions associated with such will be the sole responsibility of the event sponsor and/or its participating vendors.
5. Activities must occur within the time frame(s) specified. It is the sponsoring organization's responsibility to ensure that vendors, performers, etc. do not set-up earlier than agreed, and will begin break-down of booths, equipment, etc. promptly. Vendors, etc. must be clear of the street/area within one hour of event ending. Private property remaining beyond one hour will be removed from the street.

By my signature below I identify myself as the representative of the above-named organization and/or the individual responsible for adherence to the conditions as set forth.

Signature: Dj Thompson

Date: July 17, 2017

Printed Name: Dj Thompson

Approved by the Mayor and Council on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_. \_\_\_\_\_ For \_\_\_\_\_ Opposed \_\_\_\_\_ Abstain.

**DETAILS OF EVENT:**

Shaded areas for office use only

<b>Street Closure</b>	Note: Location map is required detailing streets to be blocked. Additionally, a State Highway Administration Request for Road Closure may be required.		
Will event require the closure of street(s)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Barricade locations must be marked on map.	
Blockage/Closure Time:	Start:	End:	If streets to be closed are Main Street, Bay Street, Broad Street, Old Ocean City Blvd., or William Street, for more than one hour, State Highway Administration Road Closure Form must be completed.  State Highway Form submitted if applicable? <input type="checkbox"/>
Will on-street parking need to be cleared?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Notes: # of barricades _____ Barricades to be dropped off: _____ Time/Date	No-Parking signs to be placed: _____ Time/date Must be placed 24 hours prior to event.
Will parking areas need to be cleared/closed?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		

<b>Electric</b>	Note: The Electric Department will assist with completion of Service Form.		
Will there be vendors or activities requiring access to electricity?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Request for Electric Service form required including information from each vendor/activity requiring electric.  Request for Electric Form submitted? <input type="checkbox"/>	
Will there be banners to be hung?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes, Request to Hang Banner form needed. Banner Form submitted? <input checked="" type="checkbox"/>	

<b>Other Items/Services:</b>		If applicable, items listed are in addition to those normally in place.	
Trash cans	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	# Required _____	Trash cans to be placed: _____ Time/date
Picnic Tables and/or Chairs	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	# Required _____ # Required _____	To be placed: _____ Time/date
Stage	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Location must be marked on map.	Stage to be placed: _____ Time/date Extensions needed: <input type="checkbox"/>
Temporary Fencing	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Location must be marked on map.	Fencing to be placed: _____ Time/date <input type="checkbox"/>
Porta-potties	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	# Standard <u>2</u> # Accessible <u>1</u>	Porta-potties will be placed in the alley on Pitts Street: _____ Time/date
Signs: Other than banners or parking	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Informational signs during the event not applicable.	Sign Permit may be required. Planning Office review _____ Date Sign Permit needed/submitted? <input type="checkbox"/>
Will there be vendors/individuals selling goods or services as part of the event?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Vendor's Application and Certification for Peddling and Soliciting will be required for EACH vendor participating in the event. If event/activity is in a municipal park a Business Use of Park Application will be required IN ADDITION to Vendor's Application and Certification for Peddling and Soliciting. Vendor's Permit(s) needed/submitted? <input checked="" type="checkbox"/>	

Additional Forms Required:	Yes	No	Date Rec'd	Initials
State Highway Administration Request for Road Closure		<input checked="" type="checkbox"/>		
Park Reservation Application and Permit	<input checked="" type="checkbox"/>		7-19	ST
Request for Electric Service	<input checked="" type="checkbox"/>		7-19	ST
Request for Banner Placement	<input checked="" type="checkbox"/>		7-19	ST
Sign Permit				
Vendor's Application and Certification for Peddling and Soliciting				
Business Use of Park Application	<input checked="" type="checkbox"/>		7-19	ST
Proof of Insurance				
Other:				



**SPECIAL EVENT  
REQUEST FOR ELECTRIC**



This form is in addition to the "Town Street Closure/Request for Services form. This form must be completed if electric service is required for any vendor/activity for an event. It is the event organizer's responsibility to coordinate with vendors regarding their electric needs; Berlin Electric Department staff will be glad to assist with any questions. Form must be signed and appropriate contact information provided to be considered. "Same as last year" will not be accepted for any category.

Today's Date: July 17, 2017

Event start time: 12:00 p.m.

Date(s) of the event: Nov. 5, 2017

Event end time: 5:00 p.m.

Name of Event: Bark For Life 2017

Number of vendors/activities needing electric service: About 10 (estimate)

Contact Name: Dj Thompson

Contact Phone (Day): 443-366-5440

Sponsoring Organization: American Cancer Society

Email: djthom421@gmail.com

Signature: 

Date: July 17, 2017

Printed Name: Dj Thompson

Side 2 must be completed.

NOTE: Electric service is available only in specific locations.

1. Complete the reverse of this form to determine vendors' electric needs. Your vendors should know their requirements.
2. Contact the Berlin Electric Department to discuss needs and to assist in determining the best location for specific vendors/activities requiring electric service.

Electric Utility Director Tim Lawrence

410-629-1713

tlawrence@berlinmd.gov

Reviewed by the Electric Utility Department: Date: \_\_\_\_\_ Initials: \_\_\_\_\_

Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**DETAILS OF EVENT: Please copy this page as needed.**

<p>Vendor: <u>DJ for Music</u> Phone: <u>443-366-5440</u></p> <p>Primary Contact: _____</p> <p>Vendor Type: <u>Entertainment</u></p> <p>Load Information</p> <table style="width:100%; border: none;"> <tr><td>Lighting</td><td>_____</td><td>KW</td></tr> <tr><td>Cooking</td><td>_____</td><td>KW</td></tr> <tr><td>Water Heating</td><td>_____</td><td>KW</td></tr> <tr><td>Miscellaneous</td><td>_____</td><td>KW</td></tr> <tr><td>Specify Unusual Motors</td><td>_____</td><td>KW</td></tr> <tr><td>Other: _____</td><td>_____</td><td>KW</td></tr> <tr><td>Total Load</td><td>_____</td><td>KW</td></tr> <tr><td>Specify Voltage</td><td>_____</td><td>KW</td></tr> </table> <p>Location of Service: _____ (determined w/Electric Department)</p>	Lighting	_____	KW	Cooking	_____	KW	Water Heating	_____	KW	Miscellaneous	_____	KW	Specify Unusual Motors	_____	KW	Other: _____	_____	KW	Total Load	_____	KW	Specify Voltage	_____	KW	<p>Vendor: _____ Phone: _____</p> <p>Primary Contact: _____</p> <p>Vendor Type: _____</p> <p>Load Information</p> <table style="width:100%; border: none;"> <tr><td>Lighting</td><td>_____</td><td>KW</td></tr> <tr><td>Cooking</td><td>_____</td><td>KW</td></tr> <tr><td>Water Heating</td><td>_____</td><td>KW</td></tr> <tr><td>Miscellaneous</td><td>_____</td><td>KW</td></tr> <tr><td>Specify Unusual Motors</td><td>_____</td><td>KW</td></tr> <tr><td>Other: _____</td><td>_____</td><td>KW</td></tr> <tr><td>Total Load</td><td>_____</td><td>KW</td></tr> <tr><td>Specify Voltage</td><td>_____</td><td>KW</td></tr> </table> <p>Location of Service: _____ (determined w/Electric Department)</p>	Lighting	_____	KW	Cooking	_____	KW	Water Heating	_____	KW	Miscellaneous	_____	KW	Specify Unusual Motors	_____	KW	Other: _____	_____	KW	Total Load	_____	KW	Specify Voltage	_____	KW
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**SPECIAL EVENT  
REQUEST TO HANG BANNER**



This form is in addition to the "Town Street Closure/Request for Services form". Banners to be hung must meet the specifications listed below. Form must be signed and appropriate contact information provided to be considered. "Same as last year" will not be accepted for any category.

Today's Date: July 17, 2017

Dates banners to be hung: Oct. 21st to Nov. 5th

Date(s) of the event: November 5, 2017

Please note: Hanging of banners is dependent on a number of factors, including weather, availability of personnel/equipment, and placement of banners for other events.

Name of Event: Bark For Life 2017

Contact Name: Dj Thompson

Contact Phone (Day): 443-366-5440

Sponsoring Organization: American Cancer Society

Email: djthom421@gmail.com

Signature: *Dj Thompson*

Date: July 17, 2017

Printed Name: Dj Thompson

**Banner Specifications:**

1. Must be made of a strong, durable material with wind stabilizing holes cut into it.
2. Must have grommets every 2' along the top and bottom
3. Must not exceed 25' in length and be between 34" and 36" in width.

**Available Locations: please check desired location(s)**

- North Main & Harrison Ave (near Fire Company)
- South Main & Buckingham (near Worcester Preparatory)
- Bay & Flower Street
- William Street

**NOTE:**

1. Suitable locations for banners are limited; the Town of Berlin cannot hang banners on private property/privately owned structures, poles, etc.
1. The Berlin Electric Department reserves the right to refuse to hang any banner for any reason within their discretion.
2. It is the responsibility of the organization to purchase and supply the banner(s).
3. The organization is responsible for delivering the banner to the Berlin Electric Department and for picking-up the banner after display. Banners not picked up within 30 days following the date of the event may be destroyed/disposed of.

**Questions:**

Electric Utility Director Tim Lawrence  
410-629-1713  
tlawrence@berlinmd.gov

Reviewed by the Electric Utility Department: Date: \_\_\_\_\_ Initials: \_\_\_\_\_

Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## TOWN OF BERLIN PARK RESERVATION FORM



**THIS FORM MUST BE COMPLETED AND DELIVERED TO TOWN HALL WITH DEPOSIT IN ORDER TO CONFIRM RESERVATION. NO VERBAL RESERVATIONS WILL BE ACCEPTED.**

TODAY'S DATE: July 17, 2017

EVENT/ACTIVITY DATE: Nov. 5, 2017 TIME FROM: 12 p.m. TO: 5 p.m.  
Anticipated # of attendees 150

NAME: Dj Thompson

ADDRESS: 110 Maple Dr.  
Berlin, MD 21811

PHONE: 443-366-5440

EMAIL: djthom421@gmail.com

ORGANIZATION: American Cancer Society  
(IF APPLICABLE)

WILL EVENT INVOLVE SALE OF GOODS OR SERVICES:  YES  NO  
If yes, Business Use of Park Application must be completed and approved by the Mayor and Council. Form must be submitted no less than 60 days prior to the event.

DESCRIPTION OF EVENT/ACTIVITY: \_\_\_\_\_

### FACILITY REQUESTED-Check all that apply

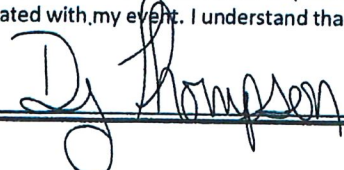
<input type="checkbox"/> <b>Dr. William Edward Henry Park, Flower Street:</b>			Water needed? (hose bib turned on only by request) <input type="checkbox"/> Yes <input type="checkbox"/> No	
Full Use _____ Partial Use _____				
<input type="checkbox"/> Pavilion Deposit of \$50.00 per day required	<input type="checkbox"/> Basketball Courts #1 _____ #2 _____ #3 _____	<input type="checkbox"/> Picnic Tables # needed _____	<input type="checkbox"/> Play Equipment	
<input checked="" type="checkbox"/> <b>Stephen Decatur Park, Tripoli Street:</b>			Water needed? (hose bib turned on only by request) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Full Use _____ Partial Use <u>  x  </u>				
<input type="checkbox"/> Pavilion Deposit of \$50.00 per day required	<input type="checkbox"/> Tennis Courts #1 _____ #2 _____ #3 _____ #4 _____	<input type="checkbox"/> Picnic Tables # needed _____	<input type="checkbox"/> Play Equipment	

**Notes/Comments:** We will not be using the pavilion other than for people to sit in as they desire. The event is more about walking and raising awareness. We will clean all areas people use.

### FEES:

ELECTRIC: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Electric fee will be \$10.00 per day.	Pavilion: \$50 X _____ (# of days) = _____ Electric: \$10 X <u>1</u> (# of days) = <u>\$10</u>	Total Due: <u>\$10.00</u> Note Deposit of \$25.00 will be returned to user if park is left in good condition after use.
--	---	--

I, the undersigned have been provided with a copy of the Park rules and regulations and I understand that I must adhere to the same rules. If I fail to adhere to the Park rules and regulations, the Town of Berlin reserves the right to refuse to reserve the park in my name in the future. Deposits for use of the pavilion and electric must be paid at time of reservation or date will not be held. I am responsible for collection and removal of all trash associated with my event. I understand that vehicles are not permitted in the parks beyond the parking lots. NO EXCEPTIONS.

Signature: 

Date: July 17, 2017

Office Use:	Date: _____
Clerk: _____ Deposit Pd: \$ _____ Date: \$ _____	Refund: <input type="checkbox"/> YES <input type="checkbox"/> NO PO #: _____





## BUSINESS USE OF PARK APPLICATION



This form is required when sale of goods or services is being requested in connection with an event or activity within a Town of Berlin Park, or on a recurring basis within a Town of Berlin Park. A Vendor's Application and Certification for Peddling and Soliciting will also be required.

Name of Business: The American Cancer Society Agent/Responsible Party: Dj Thompson  
(Individual Person must be identified)

Address 110 Maple Dr. Phone #: (W) 443-366-5440 (C) 443-366-5440  
Berlin, MD 21811 Email: djthom421@gmail.com

Park where activity or event will occur:  Stephen Decatur Park  William Henry Park

Purpose of Facility Use: To raise awareness and funds to benefit The American Cancer Society

Requested Days/Times of Use: Sunday, November 5, 2017; 12:00 p.m. - 5:00 p.m.

# of Persons Expected to participate in activity/event 150

List all individuals/employees who may/will conduct the business activity:

1) <b>Dj Thompson</b>	6)
2) <b>Dawn Hodge</b>	7)
3) <b>Deborah White</b>	8)
4) <b>Courtney Bova</b>	9)
5)	10)

Please add any other information relevant to this application: I will be working with Heather Layton and the Town Arts and Entertainment Committee to develop an event that is fun for all persons and will feature information from different organizations regarding dogs and other animals. We hope to have vendors present to sell foods and goods with the net proceeds benefitting the ACS and the fight against cancer.

Reverse must be completed and signed.

**AGREEMENT**

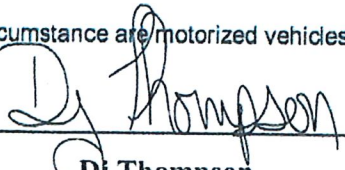
By signing below, the agent/responsible party understands that, until approval by the Mayor and Council, this form is an application for use of the parks for the aforementioned purposes, and not a permit for use. He/She further assumes full responsibility for complying with the rules and regulations set forth in the Town of Berlin Code of Ordinances and, specifically, Chapter 22, "Parks and Recreation", Sec. 22.48-50, as well as any additional terms and conditions imposed by the Mayor and Council of the Town of Berlin. He/She understand that failure to comply may result in:

1. The imposition of limitations to this permit; and/or
2. Withdrawal of this permit; and/or
3. Refusal by the Mayor and Council to authorize future use by the entity.

A copy of this permit must be in the possession of the person conducting the business activity and shown upon request.

I, further acknowledge and agree to the following:

- 1) The Mayor and Council of the Town of Berlin reserves the right to refuse approval of any permit for any reason at their discretion.
- 2) I am responsible for application for and payment of a Town of Berlin Business License Fee or Vendor Permit as applicable under the Code of the Town of Berlin, Chapter 8.
- 3) If the nature of the business activity involves the sale or provision of food or drink to be prepared on site and/or prior to sale and to be sold to and/or consumed by the public, I am responsible for obtaining any and all applicable permits from any other agencies including, but not necessarily limited to, agencies of Worcester County and the State of Maryland. The Mayor and Council of the Town of Berlin reserves the right to deny approval of this permit pending verification of appropriate permits obtained from any other agency as applicable. Alcohol sales are prohibited under any circumstance.
- 4) That, if applicable, I am responsible for completion and submission of road closure permit forms to the State Highway Administration.
- 5) The Town of Berlin is in no way responsible for my adherence to the above conditions and that any fees associated with this permit, including the Town of Berlin Business License Fee and/or Vendor Permit, paid to the Town of Berlin, are separate from and unrelated to any fee charged for any other purpose by any other agency.
- 6) I will maintain insurance appropriate to the activity proposed and will provide proof of said insurance upon request.
- 7) If appropriate to the activity proposed, I will have my customers/clients sign documents acknowledging that the Town of Berlin holds no responsibility for any loss/injury/damage incurred by their participation in my business activity.
- 8) I will be responsible for any damage to Town of Berlin owned or leased property incurred as a result of my use of the facility under this permit.
- 9) Under no circumstance are motorized vehicles permitted on parks' grounds, except those areas designated for parking of motor vehicles.

Signature: 

Date: July 19, 2017

Printed Name: Dj Thompson

Office Use Only: Date Rec'd: _____ Initials: _____
Approved by the Mayor and Council of the Town of Berlin on the ____ day of _____.
_____ For to _____ Opposed with _____ Abstaining
Additional Conditions/Notations:
_____
_____
_____

## Request for Taxpayer Identification Number and Certification

**Give Form to the  
 requester. Do not  
 send to the IRS.**

Print or type  
 See Specific Instructions on page 2.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank. <b>American Cancer Society, Inc.</b>	
2 Business name/disregarded entity name, if different from above	
3 Check appropriate box for federal tax classification; check only <b>one</b> of the following seven boxes: <input type="checkbox"/> Individual/sole proprietor or single-member LLC <input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____ Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner. <input type="checkbox"/> Other (see instructions) ▶ _____	4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) <u>1</u> Exemption from FATCA reporting code (if any) <u>A</u> <small>(Applies to accounts maintained outside the U.S.)</small>
<b>Non Profit 501 (C)(3)</b>	
5 Address (number, street, and apt. or suite no.) <b>250 Williams Street</b>	Requester's name and address (optional)
6 City, state, and ZIP code <b>Atlanta, GA 30303</b>	
7 List account number(s) here (optional)	

### Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

**Note.** If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

<b>Social security number</b>											
OR											
<b>Employer identification number</b>											
1	3	-	1	7	8	8	4	9	1		

### Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

**Certification instructions.** You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

<b>Sign Here</b>	Signature of U.S. person ▶	Date ▶ <b>January 19, 2017</b>
------------------	----------------------------	--------------------------------

### General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

**Future developments.** Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at [www.irs.gov/ww9](http://www.irs.gov/ww9).

#### Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)

- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
  - Form 1099-C (canceled debt)
  - Form 1099-A (acquisition or abandonment of secured property)
- Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.
- If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding? on page 2.*
- By signing the filled-out form, you:
- Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
  - Certify that you are not subject to backup withholding, or
  - Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
  - Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.



# STAFF REPORT

TO: Mayor and Members of the Town Council

FROM: Chief A. R. Downing *ARD*

VIA: Town Administrator Laura Allen *LA*

SUBJECT: Berlin Police Department Telephone System Contract

## RECOMMENDATION

The Berlin Police Department recommends that the Mayor and Council approve the telephone contract with Chesapeake Telephone System.

## SUMMARY

The telephone system will provide on-site recording, multi communicate points of service (Analog and Digital) with agency owned equipment (No monthly fees for equipment) and meets the department's current security standards

## FISCAL IMPACT

This project is a part of the capital budget. The recommended phone system provided a comprehensive bid of \$29,518.00 with annual fees of \$255.00. The bid includes advanced implementation & design (\$1,680) and five (5) year warranty on parts (\$2,822.80).

## BACKGROUND

The contract was bid out for the configuration, setup/installation and training on the telephone system, installation of the data jacks and pulling of the lines.

## ANALYSIS

Four bids were received **Absolute Security, Impact Technology Group, BDK and Chesapeake Telephone Systems**. It was quickly discovered that installing the data jacks and pulling the lines

was not a task that all of the bidders could complete themselves and that bid was pulled from the bid (**Absolute Security** completed that task).

- **Absolute Security's** bid was taken out of consideration due to telephone systems not being their area of expertise. The agency is looking for assistance with mapping of the system and support after installation.
- **Impact Technology Group** submitted a contract for a Cloud VoIP based system with \$3,212.04 payment with a \$890.75 (\$10,680) monthly fee (Voice service & Maintenance cost) and a five cent per minute recording charged directly to another vendor Cytracom.
- **BDK** submitted a comprehensive bid, after remaining the data jacks and pulling of the lines, came in at \$28,686.74 payment with an annual fee for the \$1,320.
- **Chesapeake Telephone Systems** submitted a comprehensive bid of \$29,518.00 with annual fees of \$255.00. The bid includes advanced implementation & Design (\$1,680) and five (5) year warranty on parts (\$2,822.80).

### ***Reasons For the Recommended Action/Findings***

**Absolute Security** was removed because of their lack of implementation and design expertise. The group could be utilized for established systems (upgrades) or basic systems. **Impact Technology Group** provided a digital only system in a cloud based environment. Without fiber optics, this system couldn't be reliable (lost internet connections cause failures) and cloud environments still have security questions and concerns not resolved to the agency's satisfaction. **BDK** provided a digital system configured with an in-house system and recording solution. Again, the system is internet depended and requires a constant and consistent signal for proper service. **Chesapeake Telephone Systems** is a dedicated telephone system company they provided a hybrid solution to be built specially for the Berlin Police Department with both analog and digital. The analog system is to be connected to Verizon with no internet dependency and the digital system would be an in-house secure system.

### **CONCLUSION**

The Berlin Police Department recommends **Chesapeake Telephone Systems** for several reasons:

1. They are a dedicated telephone systems company.
2. They have installed systems for emergency services and police agencies.
3. They provide the most comprehensive and secure service.
4. They allow the Berlin Police Department own all equipment (No monthly equipment fees)
5. They provide the longest warranty for the hardware.

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## MASTER AGREEMENT

**THIS MASTER AGREEMENT** is made and entered into 8/21/2017 by and between **Chesapeake Telephone Systems, Inc.** (hereinafter referred to as "Chesapeake"), whose business address and offices are located at **8225 A Cloverleaf Drive, Millersville, MD 21108** and Berlin Police Station (hereinafter referred to as "Customer"), whose business address is 10 William Street, Berlin , Maryland 21811 and the following is mutually agreed upon.

### 1. SCOPE OF AGREEMENT

This **Master Agreement** contains all terms and conditions agreed upon by the parties that control and administer the terms and conditions of any Purchase Agreement, Maintenance Agreement and Security interest executed by and between the parties hereto. A copy of any and all of the executed aforementioned Agreements shall be attached hereto as **ANNEXES** and incorporated herein by reference.

### 2. WARRANTIES, EXCLUSIVE REMEDIES, LIMITATIONS

Chesapeake warrants that any and all hardware and software delivered pursuant to a Purchase Agreement except for cabling shall be free from equipment defects and faulty workmanship, under normal working conditions, for a 1 Year period from the date of "CUTOVER," which is specified in any Purchase Agreement. All cabling shall be free from equipment defects and faulty workmanship, under normal working conditions, for a ninety (90) day period from the date of "Cutover." Chesapeake Further warrants that any and all service, maintenance or upgrades to any hardware or software in a Purchase Agreement, Equipment Maintenance and Service Agreement, Time and Materials Agreement, or Support and Maintenance Agreement shall be completed and performed in a good and workmanlike manner and to standards generally accepted in the industry.

Customer's exclusive remedy for a breach of any and all Hardware, Software, installation or maintenance warranty shall be limited to the following.

a) Chesapeake shall, at its expense, provide routine or emergency service and repair, replace or correct, as necessary any Hardware or Software malfunction covered by the terms of the warranty, upon receipt of notice from Customer specifying the nature of the claimed breach. Customer shall confirm such notice in writing within a reasonable amount of time. Normal service charges will apply to re-set or re-program if system changes have been generated due to lightning, or any other perils or casualties, any other acts of GOD, or operator error or misuse.

*"Emergency Service"* is defined when the performance of the system is of such a nature so as to impair sixty percent (60%) of Customer's system. **(Emergency Service is available 24 hours a day, 7 days a week).**

*"Routine Service"* is defined when the alleged breach of warranty is of such a nature so as to impair less than sixty percent (60%) of Customer's system. *"Normal Business Hours"* are Monday through Friday, excluding company holidays, between the hours of 8:30 a.m. and 5:00 p.m.

#### **Service Response Time:**

**Emergency Service:** Chesapeake will dispatch repair personnel to Customer Site within four (4) hours of notification.

#### **Routine Service:**

Chesapeake will dispatch repair personnel to Customer Site within forty-eight (48) hours of notice unless such dispatch would occur on a weekend or a holiday, whereby Chesapeake would dispatch repair personnel to Customer site on the next business day.

b) Customer hereby warrants that the Hardware, Software or installation, as applicable shall not be altered, repaired or modified by any party other than Chesapeake without Chesapeake's prior written consent, and that the alleged breach of warranty is not the result of abuse, misuse, improper maintenance or use or operation, and that the equipment is being used only in conjunction with other equipment approved and ratified by Chesapeake. Customer further warrants that the alleged breach of warranty was not caused by any condition or cause defined in Paragraph 4 of this Agreement.

Chesapeake's obligations to repair any breach of warranty are conditioned on Customer's above warranties.

PLEASE INITIAL \_\_\_\_\_

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**3. MATERIAL BREACH, REMEDIES, LIMITATIONS OF LIABILITIES**

Either Chesapeake or Customer shall be in default of this Agreement for failure to perform any obligation under this Agreement, upon an event of default, the non-defaulting party shall give a written notice to the party in default describing the nature of the default and requesting that the default be cured within fifteen (15) business days. If said default is not cured within fifteen (15) business days, the non-defaulting party shall have the option of suspending performance under this Agreement and may seek damages and other remedies as allowed hereunder and by law against the defaulting party.

Notwithstanding any other provisions of this agreement to the contrary, Chesapeake shall not be liable for any damages in excess of the cost of the hardware sold to customer under this agreement, and CHESAPEAKE will not be liable for any incidental, consequential or special damages nor for any claim against customer by any other party

Should the Customer cancel the Contract, there will be a 15% restocking fee and all labor associated with programming and prepping the system plus any associated Lawyer fees will be recouped from the Customer.

**4. ASSIGNMENT, SUBLICENSE**

No assignment or sublicense under this Agreement by Customer shall relieve Customer of primary responsibility for performance of its obligations under this Agreement. Chesapeake reserves the right to refuse to honor any assignment or sublicense made by Customer. Chesapeake reserves the right to subcontract any portion of its responsibilities under this Agreement, but shall remain primarily responsible for performance under this Agreement.

**5. FORCE MAJEURE**

Neither party shall be responsible for delays or equipment failures resulting from acts or occurrences beyond the reasonable control of such party, including, power failure, fire, lightning, floods, earthquakes, explosion, Acts of God, war revolution, riot, or as a result of government action, by law, ordinance, regulation or otherwise, additionally, labor unrest, strikes, picketing and any related acts or incidents. In any such event, the affected party shall be excused from performance to the extent of the interference: the other party shall also be excused to the same extent until the interference ceases to be a factor.

**6. CONTRACT MODIFICATION, CHANGES OR AMENDMENTS**

This Agreement and the Annexes attached hereto and incorporated herein by reference constitute the entire agreement between Chesapeake and Customer. Any amendments, modification or changes to this Agreement must be agreed to in writing and signed by authorized representatives of both parties. No provisions of this Agreement are to be construed as modifying the provisions of any other agreement between Chesapeake and Customer. This Agreement is in no way to be construed against the party drafting the Agreement.

**7. CONFIDENTIALITY/NON-DISCLOSURE**

Chesapeake and Customer hereby mutually agree and warrant that they shall keep confidential all of the other party's information and data, including, but not limited to trade secrets, processes and methods, manuals, brochures, computer hardware, computer software, disk, account books, forms, records, and customer lists to which the other party has been given access in the performance of this Agreement and Chesapeake and Customer further agree to safeguard such data from access by any unauthorized individual or company.

**8. VALIDITY**

The invalidity in whole or in part of any provision of this Agreement shall not void nor affect the validity or any other provision of this Agreement.

**9. MARYLAND LAW**

This Agreement shall be governed and construed according to the laws of the State of Maryland.

**10. AUTHORITY OF INDIVIDUALS TO SIGN CONTRACT**

Each party hereto acknowledges that individuals signing this Agreement are authorized to sign on behalf of their respective companies and that their companies are bound by the terms hereof.

Accepted by: \_\_\_\_\_

Title: \_\_\_\_\_

Print Name: \_\_\_\_\_

Date: \_\_\_\_\_



# ANNEX A

# PURCHASE AGREEMENT

SHIP TO: Berlin Police Station 10 William Street Berlin, Maryland 21811		BILL TO: Same	
DATE: 8/21/2017	Salesperson: Tim Carey	PO #	

## Schedule of Equipment and Services

Qty	Description	Ext MSRP	NJPA Price
<b>Mitel MiVoice Office Packages / Bundles</b>			
1	(LSM-4) Loop Start Line Module	\$390.00	\$241.80
	<i>Sub-Total for Mitel MiVoice Office Packages / Bundles</i>	<b>\$390.00</b>	<b>\$241.80</b>
<b>Mitel MiVoice Office System</b>			
1	CF Card 2 GB v4+ (300 Hours)	\$120.00	\$120.00
1	MiVoice Office IP Base Pack HX Controller Chassis w. Processor Module, Power Supply Dynamic Extension License Enhanced Unified Messaging for UVM License Hot-Desking License (system-wide) Meet-me Conferencing License Unified Voice Messaging (UVM) License (4 port) Category D License (16)	\$1,995.00	\$1,236.90
	<i>Sub-Total for Mitel MiVoice Office System</i>	<b>\$2,115.00</b>	<b>\$1,356.90</b>
<b>Mitel MiVoice Office Licenses</b>			
7	MiVoice Office "Cat D" IP Tel Lic	\$980.00	\$607.60
1	MiVoice Office "Cat F" SIP Tel Lic	\$100.00	\$62.00
1	File Based Music Source License (5 Max)	\$150.00	\$93.00
	<i>Sub-Total for Mitel MiVoice Office Licenses</i>	<b>\$1,230.00</b>	<b>\$762.60</b>
<b>Endpoints</b>			
1	Model 5340e GB - Full LCD IP Phone (Bkllit)	\$500.00	\$310.00
1	MiVoice Conference Unit (UC360, Audio + In Room Collaboration)	\$1,195.00	\$740.90
22	5320e IP Phone (backlit version)	\$7,260.00	\$4,501.20
	<i>Sub-Total for Endpoints</i>	<b>\$8,955.00</b>	<b>\$5,552.10</b>
<b>Mitel Miscellaneous Equipment</b>			
2	MiVOfc Call Recorder SMB Edition - 4 Ch	\$2,590.00	\$2,590.00
1	MiVOfc Call Rec STAND SWAS (8pt or less)	\$200.00	\$200.00
	<i>Sub-Total for Mitel Miscellaneous Equipment</i>	<b>\$2,790.00</b>	<b>\$2,790.00</b>
<b>Software Assurance</b>			
1	STD SWAS 5000 Base up to 24 IP Ports	\$200.00	\$124.00
	<i>Sub-Total for Software Assurance</i>	<b>\$200.00</b>	<b>\$124.00</b>



Qty	Description	Ext MSRP	NJPA Price
<b>Miscellaneous</b>			
23	Patch Cord	\$69.00	\$69.00
1	MDF materials	\$375.00	\$375.00
	<i>Sub-Total for Miscellaneous</i>	<b>\$444.00</b>	<b>\$444.00</b>
<b>Mitel Phone Manager</b>			
1	Mitel Phone Manager Starter Kit(8 Users)	\$450.00	\$450.00
	<i>Sub-Total for Mitel Phone Manager</i>	<b>\$450.00</b>	<b>\$450.00</b>
	<b>EQUIPMENT SUB-TOTAL</b>	<b>\$16,574.00</b>	<b>\$11,721.40</b>
<b>Services</b>			
<b>Installation and Design</b>			
	Implementation & design	\$720.00	\$720.00
	IP set placement		
	Advanced Implementation & design	\$1,080.00	\$1,080.00
	Project Management	\$595.00	\$595.00
	User Training	\$255.00	\$255.00
	Phone set training for 23 users		
	3 classes, 1 hr/class, max 10 attendees/class		
	Advanced Training	\$240.00	\$240.00
	PBX & ICP system admin training for 1 admins		
	1 classes, 2 hr/class, max 3 attendees/class		
<b>First Year Support</b>			
	1st Year Parts Warranty	Incl.	Incl.
	1st Year 24x7 Labor Support	Incl.	Incl.
	5 yr Extended Hardware Warranty - Mitel / Intertel Parts	\$1,360.80	\$1,360.80
	<i>Sub-Total for Services</i>	<b>\$4,250.80</b>	<b>\$4,250.80</b>
	<b>SERVICES SUB-TOTAL</b>	<b>\$4,250.80</b>	<b>\$4,250.80</b>
	<b>TOTAL PRICE</b>	<b>\$20,824.80</b>	<b>\$15,972.20</b>

*Pricing excludes taxes and is valid until 8/31/2017*

## MITEL CALL RECORDING

<u>Qty</u>	<u>Description</u>	<u>Ext MSRP</u>	<u>NJPA Price</u>
<b>Mitel MiContact Center Office</b>			
1	Quality Mgt Concurrent User License	\$1,000.00	\$620.00
	<i>Sub-Total for Mitel MiContact Center Office</i>	<b>\$1,000.00</b>	<b>\$620.00</b>
<b>Mitel Call Recording</b>			
1	MiVoice Recording Analog Win 2012 Server x 8	\$12,190.00	\$7,557.80
	<i>Sub-Total for Mitel Call Recording</i>	<b>\$12,190.00</b>	<b>\$7,557.80</b>
<b>Mitel Miscellaneous Equipment</b>			
1	CallRecording Rmt Installation Service	\$1,125.00	\$1,125.00
	<i>Sub-Total for Mitel Miscellaneous Equipment</i>	<b>\$1,125.00</b>	<b>\$1,125.00</b>
<b>Software Assurance</b>			
1	Standard Software Assurance Call Recording Base+30	\$210.00	\$130.20
	<i>Sub-Total for Software Assurance</i>	<b>\$210.00</b>	<b>\$130.20</b>
<b>Miscellaneous</b>			
1	PC monitor		
1	MDF materials	\$375.00	\$375.00
	<i>Sub-Total for Miscellaneous</i>	<b>\$375.00</b>	<b>\$375.00</b>
	<b>EQUIPMENT SUB-TOTAL</b>	<b>\$14,900.00</b>	<b>\$9,808.00</b>
<b>Services</b>			
	<b>Installation and Design</b>		
	Advanced Implementation & design	\$1,680.00	\$1,680.00
	Project Management	\$595.00	\$595.00
	<b>First Year Support</b>		
	1st Year Parts Warranty	Incl.	Incl.
	1st Year 24x7 Labor Support	Incl.	Incl.
	5 yr Extended Hardware Warranty - Mitel / Intertel Parts	\$1,462.80	\$1,462.80
	<i>Sub-Total for Services</i>	<b>\$3,737.80</b>	<b>\$3,737.80</b>
	<b>SERVICES SUB-TOTAL</b>	<b>\$3,737.80</b>	<b>\$3,737.80</b>
	<b>TOTAL PRICE</b>	<b>\$18,637.80</b>	<b>\$13,545.80</b>

Pricing excludes taxes and is valid until 8/31/2017

**MSRP / NON-NJPA TOTAL = \$39,462.60**

**GRAND TOTAL / NJPA BERLIN POLICE**

**\$29,518.00**

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**PAYMENT TERMS**

The System Price and Payment Shall be as Follows:  
Upon Acceptance of (Signed) MASTER AGREEMENT and SYSTEM PURCHASE AGREEMENT By Berlin Police Station

<b>A 50% DEPOSIT IS REQUIRED AT CONTRACT SIGNING</b>	<b>\$14,759.00</b>
40% On the Cut Over Date:	\$11,807.20
10% On Final Acceptance	\$2,951.80

Berlin Police Station shall be assessed a one time Processing Fee of **Five Percent (5%)** for any late Payments per the terms of the above schedule.

Payments received by Chesapeake that are over Thirty (30) days late, from date of invoice, shall be charged an additional Finance Charge of 3% per month compounded daily plus reasonable Legal Fees (\$250.00 minimum) on accounts referred for collection.

**\* ANY ADDITIONAL/UNFORESEEN CABLING WILL BE BILLED AT TIME AND MATERIAL RATES.**

This agreement is subject to the terms and conditions of the Master Agreement, to which this document is an integral part. It is also subject to the Terms and Conditions page of this agreement which are made a part hereof and which Berlin Police Station acknowledges that they have read carefully and understood.

\_\_\_\_\_  
Chesapeake Authorized Signature  
(Date)

\_\_\_\_\_  
Berlin Police Station Authorized Signature

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## TERMS AND CONDITIONS

1. Berlin Police Station shall buy and Chesapeake shall sell, deliver and install the equipment and software described in the above ANNEX A. Chesapeake shall grant Berlin Police Station a limited software license for any software embodied in or associated with the equipment (hardware). Together, the equipment and software shall constitute the "System".
2. Berlin Police Station is granted a non-exclusive, limited license to use the software *only* in conjunction with the purchase hardware. Software is defined as computer programs contained on a computer storage device, including but not limited to tape, floppy disk, and disk drive that operate, maintain, diagnose or document the hardware.

Berlin Police Station hereby warrants and agrees that it shall treat any and all software under this Agreement as the exclusive property and a proprietary TRADE SECRET of Chesapeake or its suppliers, if appropriate, and that it shall use the software only in conjunction with the purchased hardware. Berlin Police Station further warrants and agrees that it shall not modify or duplicate any software (Except per documented back-up procedures) in whole or part. In the event that Berlin Police Station assigns this software license to any successor in interest, Berlin Police Station agrees that the successor in interest to the hardware shall execute documents assenting to these conditions of the software license.

3. Title to the goods sold hereunder shall not pass to Berlin Police Station until payment in full is made. Chesapeake also retains a security interest in all goods sold to secure all of Berlin Police Station obligations to Chesapeake. The Security Interest is a first and prior purchase money security interest on all goods sold hereunder, and any security interest thereon securing other indebtedness now or hereafter owing by Berlin Police Station to any other person is subordinate hereto. In the event of a default in payment, Berlin Police Station grants to Chesapeake the right to enter the premises and retrieve or disable the goods, and Chesapeake shall have and may exercise any or all of the rights on default possessed by a secured party under the Maryland Uniform Commercial Code - Secured Transactions Title. Purchaser shall pay all costs and expenses incurred in enforcing Seller's remedies hereunder, including all attorney's fees incurred by Chesapeake and all advances made by Chesapeake to protect the security interest hereunder, including advances made for or on account of levies, insurance, repairs, taxes, and for maintenance or recovery of collateral. Chesapeake may record this contract as a financing statement, but recording shall not be necessary to perfect this purchase money security interest.

Interest shall accrue on all monies owed by Berlin Police Station to Chesapeake at the rate of 3% per month compounded daily from the delivery date. In the event of any default in payment when due purchaser shall pay Chesapeake's reasonable attorneys fees whether or not suit is filed, together with all cost of collection.

4. Berlin Police Station shall be responsible for any and all fees incurred by Chesapeake for obtaining any necessary building, electrical or other permits required to complete the system installation.
5. Berlin Police Station will be responsible for any charges related to cabling from Berlin Police Station site's point of entry to the site (as defined by the local telephone company) to the System location.
6. Risk of loss to the System, or any part thereof, shall pass to the Berlin Police Station upon delivery to Berlin Police Station's Installation site.
7. Chesapeake shall conduct "End-User" Training for Berlin Police Station's employees at the time of Cutover. Training shall include classroom (provided at Installation Site) and hands-on training with the equipment, as appropriate. Chesapeake shall design and conduct training sessions that ensure that Berlin Police Station's employees can operate the System and use the features and benefits of the System in a good and competent manner. Chesapeake shall make program changes for 15 days from date of install, free of charge. Any program changes after the fifteen-day period will be billable.
8. Chesapeake is not responsible for cost of any circuit orders from Verizon, or AT&T or any other common carriers, nor the delivery or operation of said circuits. All time spent by Chesapeake technicians waiting for the delivery or activation of said circuits will be billed at Chesapeake published labor rates.
9. Network Service Issues: When ordered through Chesapeake, Chesapeake will make every effort to ensure that your network service order will be completed on time and as requested, however, Chesapeake cannot guarantee timely delivery and proper operation of services ordered. Berlin Police Station understands services are provided directly by the carrier, and Chesapeake cannot be held responsible for the Carrier's performance.
10. If a certified complete network assessment providing all WAN or LAN performance levels and/or specifications is not completed and furnished by Berlin Police Station to Chesapeake prior to installation, then Berlin Police Station releases Chesapeake and agrees to hold Chesapeake harmless from any liability or claims or adjustments or setoffs for the functionality of the WAN or LAN after installation of the Voice Over IP (VoIP) system. Chesapeake is not responsible for performance problems caused by inadequacies in Berlin Police Station's WAN or LAN hardware or software.

ACCEPTANCE \_\_\_\_\_

Berlin Police Station





Telecommunications Division  
**QUOTATION / ESTIMATE**

**Bill To:** Berlin Police Department  
 Decatur St.  
 Berlin, MD 21811  
 Attn: Lieutenant Fisher

**REVISED**  
Date: 5/25/2017  
Prices Valid Until: 6/24/2017  
Prepared By: Jay Waddell  
Proposal Number: 207130-TIP

**RE: IP TELEPHONE SYSTEM**

Quantity	Description / Scope of Work:
<p><b><u>NEW NEC TELEPHONE SYSTEM EQUIPMENT LIST:</u></b></p> <p>1 <b>NEC SL1100 Communications Server</b> ~ ("The Main Chassis").            Equipped to support: <b>Four (4)</b> copper trunks, <b>thirty-two (32)</b> channel VoIP daughter board and four (4) analog telephones.            The cabinet is equipped with a central processor unit (CPU), AC Power Supply along with the blades listed below:</p> <p>1 <b>NEC Central Office Line Interface Blade</b> ~ Support for <b>four (4)</b> outside lines.            1 <b>NEC VoIP daughter board</b> ~ Support for <b>thirty-two (32)</b> IP telephones.            1 <b>NEC Analog Station Interface Blade</b> ~ Support for four (4) analog telephones.</p> <p><b><u>VOICE MAIL:</u></b></p> <p>1 <b>NEC SL1100 InMail</b> ~ Voice Messaging System.</p> <ul style="list-style-type: none"> <li>• Voice Mail to Email</li> <li>• Includes personal greetings</li> <li>• Full Automated Attendant Capability with Multiple Greetings</li> <li>• 15 Hours of storage</li> </ul> <p><b><u>TELEPHONES:</u></b></p> <p>16 <b>NEC 24-Button IP Display Telephones (\$263.00 ea.)</b></p> <p><b>NOTE:</b> Networking equipment (router &amp; switches) and patch cables provided by IT department or owner.</p> <p><b><u>Standard telephone system installation includes the following:</u></b>            Installation of all new system components detailed in equipment list.            Complete system programming. On-site training. End user system documentation documentation and user's guides, as required.</p>	
<b>Total:</b> <span style="border: 1px solid black; padding: 2px 10px;"><b>\$ 6,213.00</b></span>	

*Thank You For Your Business!*

**ABSOLUTE SECURITY GROUP**

REVISED

Client: Berlin Police Department

Date: 5/25/2017

Proposal #: 207130-TIP

**RE: IP TELEPHONE SYSTEM**

Quantity	Description / Scope of Work:
	<p><b><u>New system warranty included in purchase:</u></b> System warranty covers all new parts, software and labor for a period on One (1) Year. Labor warranty covers normal business hours: (8 am to 5 pm, Mon. - Fri.). Warranty repairs performed after normal business are subject to overtime charges.</p> <p><b><u>Payment Terms:</u></b> A 50% deposit is due upon acceptance and signing of the sales agreement. The remaining balance is due upon completion.</p>

*Thank You For Your Business!*

Prepared By: Jay Waddell

**Customer Acceptance:** \_\_\_\_\_ **Date:** \_\_\_\_\_

{We hereby accept the specifications, terms and conditions as detailed above, and authorize Absolute Security Group to proceed with the work as quoted.}



Telecommunications Division  
QUOTATION / ESTIMATE

**Bill To:** Berlin Police Department  
 Decatur St.  
 Berlin, MD 21811  
 Attn: Lieutenant Fisher

**Date:** 5/24/2017  
**Prices Valid Until:** 6/23/2017  
**Prepared By:** Jay Waddell  
**Proposal Number:** 207130-CR

**RE: CALL RECORDING**

Quantity	Description / Scope of Work:
<b><u>NEW VERSADIAL CALL RECORDING SYSTEM EQUIPMENT LIST:</u></b>	
1	Versadial Basic PC, 1TB hard drive.
1	8-Channel analog circuit card
1	VoIP Channel license
1	TDM Channel license
1	21" LED Color Monitor
1	UPS
<p><b>NOTE:</b> Networking equipment (router &amp; switches) and patch cables provided by IT department or owner.</p> <p><b><u>Call Recording system installation includes the following:</u></b>            Installation of all new system components detailed in equipment list.            Complete system programming. On-site training. End user system documentation documentation and user's guides, as required.</p> <p><b><u>New system warranty included in purchase:</u></b>            System warranty covers all new parts, software and labor for a period on One (1) Year. Labor warranty covers normal business hours: (8 am to 5 pm, Mon. - Fri.). Warranty repairs performed after normal business are subject to overtime charges.</p> <p><b><u>Payment Terms:</u></b>            A 50% deposit is due upon acceptance and signing of the sales agreement. The remaining balance is due upon completion.</p>	
<b>Total: \$ 7,650.00</b>	

*Thank You For Your Business!*

Prepared By: Jay Waddell

**Customer Acceptance:** \_\_\_\_\_ **Date:** \_\_\_\_\_

{We hereby accept the specifications, terms and conditions as detailed above, and authorize Absolute Security Group to proceed with the work as quoted.}



Cabling	Price	Qty	Ext. Price
Cabling for this solution has been addressed and quoted in Quote #1740 as part of building pre-wiring and infrastructure. See quote for details.			

Voice Service	Monthly Recurring	Qty	Ext. Recurring
<b>CYTRACOM</b> <b>Cloud VoIP Phone System-Unlimited Line w/ Evolve</b> *Over 150 Business Class Features *Call Management *Call Conferencing *Mobility *Reporting & Analytics *Unlimited Local/Long Distance Calling in US *Provides a hardware refresh (new phone) every 3 years to keep current with the latest hardware and technology.	\$27.95	20	\$559.00
<b>Local 10 Digit DID</b> Local 10 Digit Telephone Number	\$2.95	4	\$11.80
<b>Paging Extension</b> Paging Extension	\$4.95	1	\$4.95
<b>Recurring Subtotal:</b>			<b>\$575.75</b>


Support/Maintenance Plan	Monthly Recurring	Qty	Ext. Recurring
<b>Onsite Support from IMPACT - per Extension</b> Onsite Support from IMPACT to Augment Provider Remote Support - Priced per Extension	\$15.00	21	\$315.00
Services for maintenance and support are quoted as optional items. Include onsite support for any issues during term.			
IMPACT recommends our unlimited remote support and maintenance plan with the phone system. Without it, you still have 24x7 technical support, but only from the manufacturer.			
Remote support is provided by Cytracom. IMPACT only provides onsite support, custom configurations, and installation of solution/system. IMPACT support plan is required for any service work outside the scope of Cytracom's remote support.			
<b>Recurring Subtotal:</b>			<b>\$315.00</b>


Voice Setup	Price	Qty	Ext. Price
<b>Site Setup &amp; Design</b> Cloud PBX Design, Programming, and Setup Fee Includes setup, configuration and implementation of call flow, extensions, phone numbers, directory listing, DND, etc. Includes 1 hour of customization. Additional customization available at normal hourly rates.	\$595.00	1	\$595.00
<b>End User Training</b> Training for end users in group setting for basic phone features, setup, and use.  Requires user sign-off for core users and/or group.	\$300.00	1	\$300.00









Voice Setup		Price	Qty	Ext. Price
Services quoted are for necessary configuration of cloud PBX system, onsite installation of devices, and training.				
			<b>Subtotal:</b>	<b>\$895.00</b>

Call Recording		Price	Qty	Ext. Price
	<b>Call Recording (per min)</b> Call Recording (Per Minute - storage free for 30 days)	\$0.00	1	\$0.00
Cost of call recording is \$0.005/min and will be billed by Cytracom directly.				


Handsets - Basic		Price	Qty	Ext. Price
	<b>Grandstream GXP-2130</b> Grandstream GXP-2130	\$0.00	13	\$0.00



Handsets - Built-In Sidecar		Price	Qty	Ext. Price
	<b>Grandstream GXP-2160</b> Grandstream GXP-2160	\$30.00	4	\$120.00
			<b>Subtotal:</b>	<b>\$120.00</b>

Handsets - Advanced		Price	Qty	Ext. Price
	<b>Grandstream GXP-2140</b> Grandstream GXP-2140 for use with GXP-2200	\$20.00	2	\$40.00
	<b>Grandstream GXP-2200</b> Grandstream GXP-2200 Digital Sidecar for use with GXP-2140.	\$90.00	2	\$180.00
			<b>Subtotal:</b>	<b>\$220.00</b>

Conference		Price	Qty	Ext. Price
	<b>Polycom SoundStation IP 6000 Conference Phone</b> Polycom SoundStation IP 6000 Conference Phone - 1 x RJ-45 10/100Base-TX PoE, 1 x Sub-mini phone Headset, 2 x RJ-9	\$360.00	1	\$360.00



Conference		Price	Qty	Ext. Price
	<b>Polycom SoundStation IP 6000 Expansion Microphones</b> Polycom SoundStation IP 6000 Conference Phone Expansion Microphones	\$299.95	1	\$299.95
<b>Subtotal:</b>				<b>\$659.95</b>

Paging System		Price	Qty	Ext. Price
	<b>Snom PA-1 PA System</b> Snom PA-1 PA System - 4 Watt Power Amplifier - Ethernet: 2 x IEEE 802.3 - PoE: IEEE 802.3af - Remote Volume Configuration	\$169.95	1	\$169.95
	<b>All-Weather Commercial Surface Mount Speaker - 4"</b> All-Weather Commercial Series Surface Mount Speaker - 70-Volt - 4" Woofer - 72Hz - 20 kHz - 6.5" x 8.9" x 6.75" - Lifetime Limited Warranty	\$99.00	1	\$99.00
<b>Subtotal:</b>				<b>\$268.95</b>

Handset Installation		Price	Qty	Ext. Price
	<b>Handset Installation &amp; Configuration Fee</b>	\$25.00	21	\$525.00
<b>Subtotal:</b>				<b>\$525.00</b>

Network Configuration		Price	Qty	Ext. Price
	<b>Configuration Updates of Existing Network for Voic</b> IMPACT will update the configuration, within availability and feature set of existing equipment, to accommodate phone system and separate voice traffic from data traffic so that there is no conflict or services degradation.	\$300.00	1	\$300.00
<b>Subtotal:</b>				<b>\$300.00</b>

Shipping		Price	Qty	Ext. Price
	<b>Shipping</b>	\$7.00	21	\$147.00
<b>Subtotal:</b>				<b>\$147.00</b>



## New Headquarters VoIP Phone System

**Information:**

Quote #: 001745  
 Version: 1  
 Delivery Date: 05/01/2017  
 Expiration Date: 05/31/2017

**Prepared for:**

Berlin Police Department  
 129 Decatur Avenue  
 Berlin, MD 21811  
 Robert Fisher  
 rfisher@berlinmdpd.org  
 (410) 641-1333

**Prepared by:**

IMPACT Technology Group, Inc.  
 Justin Kelley  
 443-365-2531  
 Fax 410-779-9412  
 jkelley@impacttg.com



Quote Summary		Amount
Voice Setup		\$895.00
Handsets - Built-In Sidecar		\$120.00
Handsets - Advanced		\$220.00
Conference		\$659.95
Paging System		\$268.95
Handset Installation		\$525.00
Network Configuration		\$300.00
Subtotal		<b>\$2,988.90</b>
Shipping		<b>\$147.00</b>
Tax		<b>\$76.14</b>
Total		<b>\$3,212.04</b>

Monthly Expenses Summary		Amount
Voice Service		\$575.75
Support/Maintenance Plan		\$315.00
Monthly Total		<b>\$890.75</b>

Acceptance of this Quote, Estimate, Proposal, and/or Agreement constitutes an Order, where you agree to the Terms and Conditions set forth herein, and as per any Agreement, below, and by IMPACT Technology Group's general Terms and Conditions. For full details and a complete list of terms and conditions, go to <http://impacttg.com/terms>

Your electronic signature, per the Electronic Signature Act, is considered equivalent to your signed and faxed signature, and allows you to accept and place your order. A copy of this acceptance and the attached quote/estimate/proposal/contract document will be sent to your email address to complete your order acceptance. You are NOT required to electronically sign your order, and you may fax, scan/email, or mail your signed order to us if you prefer. If you have any questions, please feel free to contact us.

Customer/Client agree to be bound by these terms, conditions and fees, are authorized to sign and accept on behalf of Client as an authorized agent, as indicated by the signature below.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

# Berlin Maryland Police Department

PROJECT TASKS	LABOR HOURS	LABOR COST (\$)	MATERIAL COST (\$)	Re-Occur Cost (\$)	Total (\$)
DATA JACKS & PULLS					
100 Pulls Cat6e Cable (includes Cat6e Cable)	0.0	\$0.00	\$4,800.00	\$0.00	\$4,800.00
Punch Down and Tone Out	64.0	\$5,440.00	\$0.00	\$0.00	\$5,440.00
Wall Plates, Jacks, RJ45 Ends, Brackets, Cable ties	0.0	\$0.00	\$500.00	\$0.00	\$500.00
3 - 48 Port Punch Panels	0.0	\$0.00	\$300.00	\$0.00	\$300.00
Various Patch Cables - 1', 2', 7', 10', 15'	0.0	\$0.00	\$375.00	\$0.00	\$375.00
<b>Subtotal</b>	<b>64.0</b>	<b>\$5,440.00</b>	<b>\$5,975.00</b>	<b>\$0.00</b>	<b>\$11,415.00</b>

NETWORK EQUIPMENT					
2 - 48 Pt Cisco POE Switch & 1 - 24 Pt Cisco POE	0.0	\$0.00	\$5,500.00	\$0.00	\$5,500.00
Cisco 5506 Firewall with VPN & Smartnet	0.0	\$0.00	\$900.00	\$0.00	\$900.00
KVM Console Switch with Monitor & Keyboard	0.0	\$0.00	\$1,375.00	\$0.00	\$1,375.00
Ubiquiti Network Unified Pro	0.0	\$0.00	\$600.00	\$0.00	\$600.00
Installation & Configuration	16.0	\$2,000.00	\$0.00	\$0.00	\$2,000.00
<b>Subtotal</b>	<b>16.0</b>	<b>\$2,000.00</b>	<b>\$8,375.00</b>	<b>\$0.00</b>	<b>\$10,375.00</b>

Rack & UPS					
Open Post NetShelf Rack with Power Dist Unit	0.0	\$0.00	\$1,000.00	\$0.00	\$1,000.00
UPS - APC 3000VA with Step Down Unit & Shipping	0.0	\$0.00	\$2,915.00	\$0.00	\$2,915.00
Labor to Install Rack & UPS	4.0	\$380.00	\$0.00	\$0.00	\$380.00
Testing and Failover of UPS	4.0	\$380.00	\$0.00	\$0.00	\$380.00
<b>Subtotal</b>	<b>8.0</b>	<b>\$760.00</b>	<b>\$3,915.00</b>	<b>\$0.00</b>	<b>\$4,675.00</b>

PROJECT MANAGEMENT					
Customer Progress Meetings/Reports	14.0	\$1,330.00	\$0.00	\$0.00	\$1,330.00
Internal Status Meetings/Reports	4.0	\$380.00	\$0.00	\$0.00	\$380.00
Third-Party Vendor Interface	2.0	\$190.00	\$0.00	\$0.00	\$190.00
Quality Assurance	4.0	\$380.00	\$0.00	\$0.00	\$380.00
Overall Project Management	4.0	\$380.00	\$0.00	\$0.00	\$380.00
<b>Subtotal</b>	<b>28.0</b>	<b>\$2,660.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$2,660.00</b>

<b>Total</b>	<b>116.0</b>	<b>\$10,860.00</b>	<b>\$18,265.00</b>	<b>\$0.00</b>	<b>\$29,125.00</b>
<b>20% Due Upon Acceptance</b>					<b>\$5,825.00</b>
<b>Balance Due</b>					<b>\$23,300.00</b>
Hardware - 21 Phones & Peplink	0.0	\$0.00	\$4,197.89	\$0.00	\$4,197.89

# Berlin Maryland Police Department

PROJECT TASKS	LABOR HOURS	LABOR COST (\$)	MATERIAL COST (\$)	Re-Occur Cost (\$)	Total (\$)
Installation Cost	24.0	\$2,280.00	\$0.00	\$0.00	\$2,280.00
Recording (\$60/yr/extension) 22 units - Annual Fee	8.0	\$900.00	\$0.00	-\$1,320.00	\$2,220.00
Phone Bill - (Monthly)	0.0	\$0.00	\$0.00	\$341.85	\$341.85
<b>Subtotal</b>	<b>32.0</b>	<b>\$3,180.00</b>	<b>\$4,197.89</b>	<b>\$1,661.85</b>	<b>\$9,039.74</b>

VOIP PHONE  
(SEE DETAIL)

Server w/ 3 year on site warranty	0.0	\$0.00	\$7,500.00	\$0.00	\$7,500.00
PC w/ 3 year onsite warranty - 21 units	0.0	\$0.00	\$13,125.00	\$0.00	\$13,125.00
LG Monitors w/ 3yr warranty- 21 units	0.0	\$0.00	\$3,129.00	\$0.00	\$3,129.00
Wireless Keyboard & Mice - 21 units	0.0	\$0.00	\$819.00	\$0.00	\$819.00
Suggested Server Upgrades	0.0	\$0.00	\$2,500.00	\$0.00	\$2,500.00
Installation Cost - Server & Domain	40.0	\$5,000.00	\$0.00	\$0.00	\$5,000.00
Installation Cost (2hrs/PC)	42.0	\$3,990.00	\$0.00	\$0.00	\$3,990.00
<b>Subtotal</b>	<b>82.0</b>	<b>\$8,990.00</b>	<b>\$27,073.00</b>	<b>\$0.00</b>	<b>\$36,063.00</b>

OTHER  
COST

<b>Total</b>	<b>114.0</b>	<b>\$ 12,170.00</b>	<b>\$ 31,270.89</b>	<b>\$ 1,661.85</b>	<b>\$ 45,102.74</b>
<b>20% Due Upon Acceptance</b>				<b>\$9,020.55</b>	
<b>Balance Due</b>					<b>\$36,082.19</b>



# Mayor & Council of Berlin

10 William Street, Berlin, Maryland 21811

Phone 410-641-2770 Fax 410-641-2316

www.berlinmd.gov



## STAFF REPORT

TO: Mayor and Members of the Town Council

FROM: David J. Deutsch, Project Coordinator *DJD*

VIA: Laura Allen, Town Administrator *LA*

SUBJ: Berlin Falls Park Studies

DATE: August 24, 2017

### RECOMMENDATION

Staff recommends that Council accept the four (4) studies regarding Berlin Falls Park (BFP). Staff further recommends that Council direct staff to continue to follow up on the information contained in the studies.

### EXECUTIVE SUMMARY

The Town has received four studies regarding BFP:

1. Berlin Falls Park Interpretive Plan, which was produced by a local organization, Conservation Community Consulting, LLC. (CCC). The principals of CCC, Dave Wilson and Jim Rapp, will brief Council at your September 11<sup>th</sup> Meeting.
2. EA Engineering, Sciences, and Technology, Inc., PBC (EA) of Hunt Valley, MD was retained to provide a report regarding the remediation of the former wastewater lagoons at BFP.
3. The Town contracted with Davis, Bowen & Friedel (DBF), a Salisbury engineering consulting firm to produce a condition assessment/structural engineering overview of the main building at BFP which housed the Tyson chicken processing plant.
4. A bacteriological report prepared regarding the wastewater lagoons, which was produced by Professor Ellen Silbergeld of Johns Hopkins University and Professor Jennifer Nyland of Salisbury University

### FISCAL IMPACT

The fiscal impact of implementing the recommendations from the studies ranges from zero impact (the bacteriological report) to \$6.8 million for full remediation of the wastewater lagoons. Sandwiched in between those costs are the implementation of the CCC Interpretive Plan at \$275,900 and the rehabilitation of the Tyson building, with a preliminary estimate of \$2.3 million.

## BACKGROUND AND ANALYSIS

The four reports cited above are described in greater detail below:

- A. Berlin Falls Park Interpretive Plan. The report is a positive step forward in creating a usable community amenity that can incorporate various activities while simultaneously protecting and enhancing the environment. The Plan's objectives include:

- \*Offering ways to protect and enhance the park's natural habitats and the species that inhabit them.
- \*Draw out the natural features with an interpretive plan highlighting natural features such as plants and wildlife.
- \*Make recommendations for green infrastructure and play/interpretive areas.
- \*Recommend the marketing of natural features.
- \*Suggest compatible uses.

The report addresses the need to control invasive plant species, yet in a demonstration of practicality and common sense, the report recommends timing the removal of invasives with a coordinated planting plan. The report points out that the Natural Resources Conservation Service (NRCS) an arm of the United States Department of Agriculture, can potentially assist with recommendations in this area.

CCC mentions the need to control the population of Canada Geese, which will become important as more park visitors will be using the park's trails. CCC also proposes the installation of nest boxes to enhance the appreciation of the various bird species found at the park. CCC says support for implementing this item may be available from various outside sources, including volunteers. CCC addresses pond hydrology and cites NRCS as a potential source of engineering plans for pond maintenance. (This specific focus will need to be reviewed in concert with the pond remediation recommendations from EA Engineering.)

CCC suggests using outdoor interpretive panels at various locations to assist in the public's understanding of the park's environmental features. Although the report is titled "Berlin Falls Park Interpretive Plan", CCC suggests changing the name of the park to increase its marketing potential while focusing on some of the salient features of the park.

The report contains a budget, with an estimated total expenditure of \$275,900. CCC also points out prospective funding partners, as well as some aspects of park development that could potentially be implemented by the Town's Public Works Department.

- B. EA Engineering Lagoon Remediation Report. EA was retained to provide a report regarding the remediation of the former wastewater lagoons at BFP. EA was

requested to provide conceptual approaches and conceptual level cost estimates to remove sediments. EA's report contains an Alternative 1 at \$6,821,000, and an Alternative 2 at \$6,780,000. The simple math indicates a less than one percent difference in the cost of these Alternatives. EA also provided additional "Options" not addressed in the 72 page report. Option 1 is a \$5 million project and Option 2 is a \$2.5 million project. Of course, as with any issue, the "Do Nothing" alternative exists. Thus the cost range for implementing the EA report is zero to \$6,821,000. Option 2 involves site preparation, purchasing and placement of off-site soil sufficient to fill the south the south lagoon. Eliminating the south lagoon in this way yields an additional 3.7 acres for potential active park use. The benefits of "producing" an additional 3.7 acres need to be weighed against the \$2.5 million project cost. How can the Town maximize that area in an overall park development project is the key question that will need to be addressed. In addition the implications of not proceeding with any of the higher cost considerations will need to be analyzed. For example, what activities/uses are precluded if sediment is not removed from the lagoons?

- C. DBF Building Assessment. DBF was asked to provide a general visual assessment of the condition of the main building on the property, and to provide recommendations for repair and replacement of building components. The building is over forty years old and contains approximately 65,000 square feet. DBF assessed each area of the building, including office areas, processing areas, shipping and dry storage. The Executive Summary states:

"Recommendations presented in the report reflect the minimum effort to repair, reinforce and stabilize the building structurally. Other recommendations reflect the minimum effort to reestablish the building envelop(e) preventing water infiltration, as well as upgrading insulation of the roof and walls to meet the intent of the International Energy Conservation Code. No mechanical, electrical or plumbing systems are salvageable.

In summary, the facility is generally structurally sound and therefore suitable for adaptive reuse. Despite numerous areas of damage, neglect, deterioration, improper alterations and local failure, the building can be repaired and reconstructed to suit the desired reuse and occupancy. Architectural and engineering design services, including mechanical, electrical and plumbing would be required to advance this rehabilitation project to the next phase. The next phase is anticipated to be schematic design for the desired reuse in conjunction with the structural stabilization and re-establishment of the building envelope."

DBF provided a cost estimate to salvage the building of \$2,307,445. It should be noted that these costs relate only to repairs of various major aspects of the building, including limited demolition costs, structural repairs, exterior walls,



interior floors and roofing. DBF has been asked to develop additional cost information regarding demolition as well as the required building systems in a building rehabilitation. Although DBF will provide some cost estimates for installing new HVAC, plumbing and electrical systems, it needs to be recognized that the estimates can only become more precise after a consensus is reached on the future use, if any, of the building.

- D. The Scientists Report. The two professors studied the issue of the potential presence of pathogenic bacteria in the wastewater lagoons. Using data from the EA study, Dr. Silbergeld and Dr. Nyland were able to conclude that “there is no evidence for the presence of bacteria of health concern at the site sampled”.

## **CONCLUSION**

Council should accept the reports, and provide any guidance to staff as the focus on BFP planning continues. A potential citizen advisory committee, and the ongoing involvement of the Town’s Parks Commission will assist Council in reaching decisions about the future use of this important community asset. Staff will present this overview to the Parks Commission at its September 5<sup>th</sup> Meeting. It is our expectation that we will be back before you with an update in approximately ninety (90) days.

Attachments (4)

# BERLIN FALLS PARK INTERPRETIVE PLAN



PRESENTED BY  
CONSERVATION COMMUNITY CONSULTING, LLC

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Photographs by Ethan Holland, Frode Jacobsen, Maryland Herp Atlas, Nancy Powell, Jim Rapp, Dave Wilson.

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*A pair of out-of-town visitors survey the ponds for ducks and turtles.*

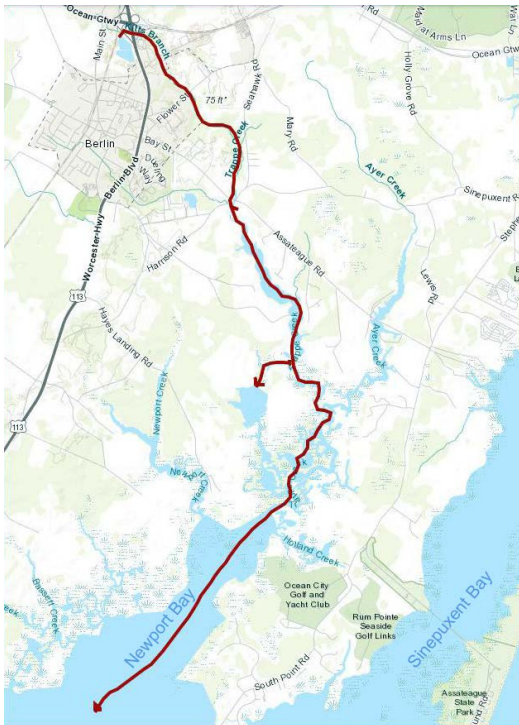


# INTRODUCTION

Owned and operated by Hudson Foods and later by the Tyson corporation, what is now Berlin Falls Park has undergone a unique transition. The 40-year old chicken processing plant was acquired for development by Berlin Properties North LLC in 2005 and purchased by the town of Berlin for a park in February 2016. Wastewater from the 64-acre plant formerly flowed into Kitts Branch which drained to Trappe Creek and ultimately out to Newport Bay behind South Point and Assateague. The closing of the plant has improved water quality in these bodies, albeit gradually.

After closing, the site quickly became a hot spot for birders who flocked to the ponds in winter, spring, and fall to see a variety of ducks, wading birds, and hard-to-find shorebirds. The 180 species seen at the site ([ebird.org/ebird/hotspot/L467175](http://ebird.org/ebird/hotspot/L467175)) are testimony to the property's avian abundance. The shallowness of the ponds and location along the Atlantic migratory flyway make it an ideal spot for migratory birds. But beautiful residents, like green herons, wood ducks, indigo buntings, and blue grosbeaks, breed there too. With a little coaxing, blue birds and other iconic species could be added to that mix.

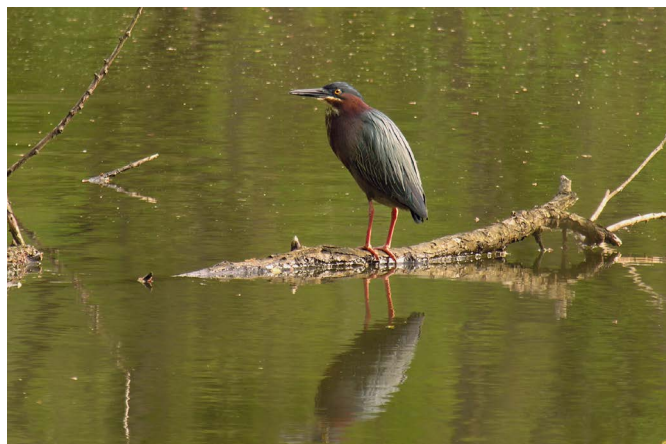
Research conducted during the Maryland Amphibian & Reptile Atlas shows the ponds to have an abundance of painted turtles which share the water bodies with red-bellied cooters and snapping turtles. The park is also famous for its pair of otters that feast on sunfish residing in the upper ponds.



**Know the flow.** The ponds at Berlin Falls Park drain into Kitts Branch which flows to Trappe Creek and ultimately empties out to Newport Bay behind South Point and Assateague.



*Migratory birds are one of the park's biggest draws.*



*Green herons nest in the floating aquatic plants in the upper ponds at Berlin Falls Park.*

# OPPORTUNITY

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Berlin Falls Park promises to bring a popular natural amenity to the town. The park enjoys the perfect combination of higher impact usage on its road-frontage end and more passive usage in its interior. The well-known birding hot spot, otter playground, and painted turtle haven boasts natural assets that can be stewarded, enhanced, and advertised. The park can serve as a hub for visiting birders, cyclists and outdoor enthusiasts to begin their exploration of Berlin and the surrounding region via road and rail, and return to Berlin to stay and play.

This proposal is designed to offer ways to keep and enhance these natural amenities and make them a central attraction for park visitors. The marketability of these features is limitless. At the same time, the sensitive nature of these natural assets render them susceptible to disturbances in hydrology and habitat type and quality. This plan aims to interpret these natural features and ensure they remain a central attraction to the park--both through habitat protection and enhancement and through advertising Berlin as a place to enjoy not just cultural, but natural gems.

# OBJECTIVES

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This proposal seeks to:

- Offer ways to protect and enhance the park's natural habitats and the species that inhabit them.
- Draw out these natural features with an interpretive plan highlighting natural features such as plants and wildlife
- Make recommendations for green infrastructure and play/interpretive areas
- Recommend how to market natural features
- Suggest compatible uses

# METHODS

---

Conservation Community Consulting, LLC made 14 site visits between November 2016 and June 2017 with representatives from USDA and town administration and public works departments to assess the site and devise a plan of action. With guidance from the town, Conservation Community Consulting, LLC used data or input from the Maryland Department of Natural Resources, Maryland Coastal Bays Program, USFWS, USDA's Natural Resources Conservation Service, Maryland Biodiversity Project, Cornell Lab of Ornithology, and Audubon Maryland-DC to help frame recommendations for wildlife enhancements at the park.

# MAP







# MANAGEMENT

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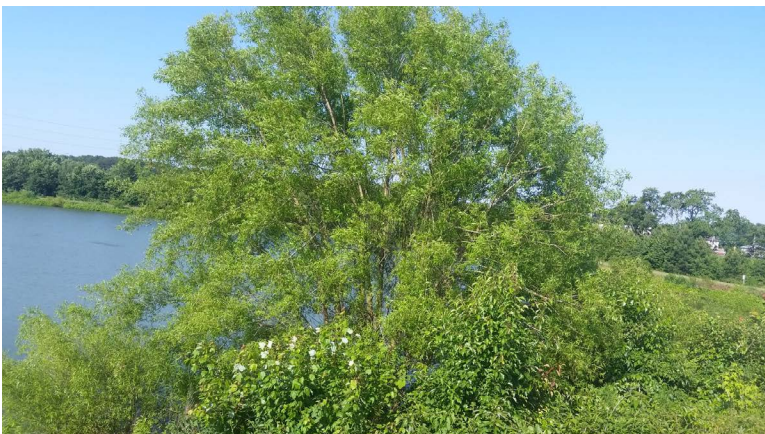
## Wildlife/habitat

**Remove invasive plants and plant native ones.** A host of invasive plants including Japanese stiltgrass, Phragmites, Japanese honeysuckle, multiflora rose, Russian olive and privet are dominating sections of the site. Most of this is due to past disturbance and is typical of altered sites. Removal of invasives should wait until a planting plan has been put in place and planting is ready to begin. This can be phased in by area to avoid native plant removal that may result in erosion if soils are exposed. The Natural Resources Conservation Service can make very specific recommendations on what to remove, how to remove it, and what seasonal wildflowers, fruit-producing trees, and wetland plants to plant on all locations on the site. Pond-side invasive wetland plants and the park's westernmost berm will demand the most attention.



*Invasive plants, like these, should be removed and replaced with native ones.*

**Nurture willow oaks.** The wildlife friendly native willow oaks on the edge of the ponds should be left to proliferate on their western, northern, and eastern sides. Cutting them is providing sunlight for the highly invasive Japanese stilt grass and warming the water which is helping to produce algae. Cut outs for water access are still appropriate. Pond-side trees will serve the dual function of taking up nutrients and providing shade in the summer months which can improve water quality, limit invasive proliferation, and provide wildlife habitat for herons, turtles, frogs, and a variety of songbirds.



*Willow oaks, left undisturbed, can shade and cool the pond, provide wildlife habitat and remove excess nutrients.*

**Create basking and perching platforms.** The park has one of the largest painted turtle populations on the Lower Shore. They are a turtle that loves to bask on logs in open water, but few basking areas exist. The park could easily add a turtle “wow factor” by placing sturdy, non-mobile structures just off the shore to give park visitors a good look at the reptiles and to assist in their survivability. Natural perches can also be installed to attract red-bellied cooters, herons, egrets, cormorants, and other charismatic waterbirds. Infrastructure from the site or fill from other work there could be utilized to create these basking areas.



*Basking platforms can be installed both to help painted turtles get warm and to give park visitors great looks at them.*

**Consider floating wetland islands.** Floating wetland islands can be used for the dual function of improving water quality and providing wildlife habitat. Anchored but floating on the water’s surface, these islands use plants to reduce nitrogen, ammonia, phosphorous, solids, and pathogens. A number of companies and NGOs now both use and sell this innovative technology.



*Floating wetland islands, like these at Trap Pond State Park in Delaware, can be used for the dual function of improving water quality and providing wildlife habitat.*

**Control Canada geese and white-tailed deer.** Resident Canada geese can significantly impact water quality and are leading to the decline of the native migratory Canada geese. Every effort should be made to limit their numbers on the property in the summer months. White-tailed deer will also cause problems in the event the town removes invasive plants and plants native species. The town should consider controlling these species by limiting cut grass to paths (for geese) and by establishing late fall or winter deer hunting near the railroad tracks.



*White-tailed deer can wreak havoc on plant and animal communities by browsing forest understory, spreading invasive plants, and altering ecosystems. Efforts should be made to control their numbers.*

**Install nest boxes for bluebirds and wood ducks.** This may involve the use of volunteers and can be phased in over the next several years. Assistance can be provided by conservation partners, such as Scout Troops, USDA Natural Resource Conservation Service (Steve Strano), U.S. Fish & Wildlife (Dan Murphy), and Audubon Maryland-DC (Dave Curson). Scout Troops and grant funding can cover much of the costs of these boxes. The same boxes may also attract nesting screech owls, hooded mergansers, great-crested flycatchers, and tree swallows.



*Bluebird boxes are inexpensive and easy to install.*



*Wood duck box creation and installation is a common Scout Troop project.*

## Hydrology

**Devise a plan to manage pond hydrology.** The shallowness of the big ponds is what draws ducks, wading birds, and rare shorebirds. The town should make sure the back of the large pond remains shallow and holds mud-flat habitat for part of the year. The two upper ponds are in better shape from a water quality standpoint and the town should consider leaving the planting platforms which allow for nutrient uptake, basking for turtles, and habitat for hard-to-see but colorful birds like green herons which breed there. The upper ponds also have a substantial sunfish population. Painted, red-bellied, and snapping turtles overwinter in the muddy bottom of the ponds so dredging work should be avoided in all ponds October 15–May 1. The Natural Resources Conservation Service can draw up specific engineering plans for pond maintenance.



*Pond depth is extremely important to dabbling ducks that winter in the pond. If the water is too deep, they will abandon the site.*

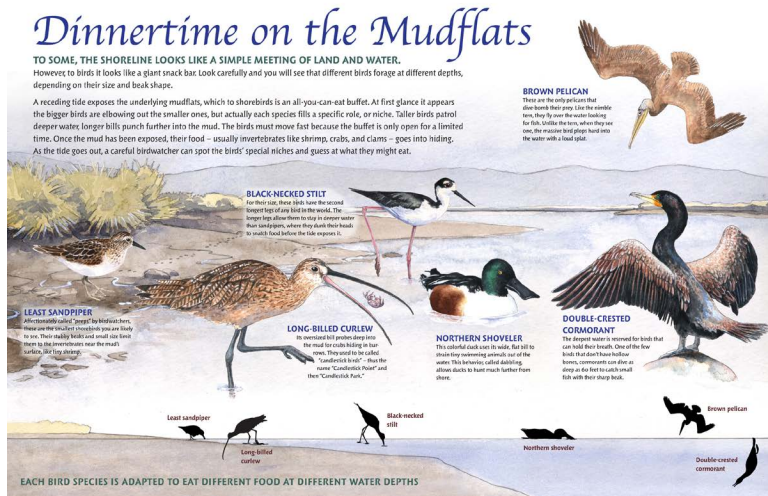
**Improve degraded wetlands.** In addition to the ponds, wetlands exist in the woods next to the railroad tracks, behind the top pond, and in the field on the southeast side of the property. These degraded sites are ready for restoration (p.3–4). The Natural Resources Conservation Service can draw up specific engineering plans for their improvement. When removing and replacing the infrastructure on the south side of the property, the town should also consider dual-function stormwater management to hold stormwater in a more natural, wildlife-friendly manner with larger, shallower plant-filled ponds.



*Wetlands behind the ponds and adjacent to the railroad tracks have been altered and degraded over several decades. They can be restored.*

# INTERPRETATION

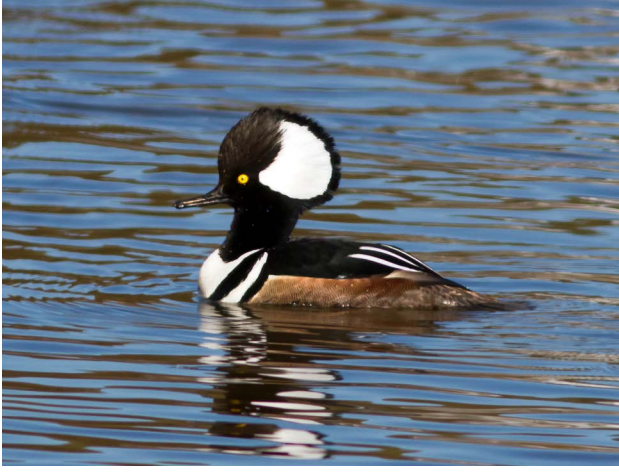
**Begin design phase for outdoor interpretive panels** that highlight natural features of the park. Conservation Community Consulting recommends six interpretive panels that cover birds, reptiles, amphibians, mammals, plants, and wetlands that the site is known for. See map on p.3 for siting and budget on p.15 for size and cost information.



Interpretive panels can detail one species and one habitat, or many species and many habitats, or a combination of both.



Panels come in a variety of shapes and sizes from wood to plastic to metal with different kinds of mounts.



Migratory birds, like this hooded merganser, are frequent fall, winter, and spring visitors. Interpretive panels would highlight this spectacle with the most common migratory visitors and their behavior.



Turtles could be big draws to the park. Painted turtles, red-bellied cooters, and snapping turtles, like this burly specimen, are relatively easy to see and make for good interpretive panel prose.



Bull frogs and northern green frogs call the ponds home. In the woods, Copes gray treefrogs, spring peepers, s. leopard frogs, and green treefrogs are also abundant. A panel explaining their habitat needs and behavior is a warranted addition.



A family of river otters lives in the park. The charismatic species could be described on interpretive panels.



Native swamp rose grows along the outside border of the ponds. The significance of this and other native plant species is an important lesson for budding naturalists.



Wetlands like this one behind the smaller pond near the entrance can be restored or improved. Interpretive panels can highlight this work.

**Conduct environmental programs.** The town should consider inviting or hiring NGOs or others to run environmental programs on the site covering wildlife, plant, and wetland ecology. Nearby businesses that benefit from the crowds could sponsor the programs.



*Eastern gartersnakes are frequent visitors to the property. Regular programs sponsored by Berlin and conducted by local environmental NGOs would educate the public and coax people to the park.*

## PLAY AREAS

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**Develop nature-based play areas.** Consider converting an existing structure on the property to a climbing wall. The tank near the entrance may be a viable option for such a wall should it prove structurally sound. This could be part of the development of nature-based play structures and areas that will complement the natural aspects of the park and help kids connect to nature and simple ecological concepts. Even skateboarding areas can be nature-oriented. This may involve the use of volunteers, and can be phased in over the next several years. Agency and competitive grant funding could cover much of the costs of these plans.



*Nature-based play areas come in a variety of shapes and sizes.*

# MARKETING

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**Create and manage a Facebook page.** Conservation Community Consulting created a Facebook page on which we post nature-based posts about the park 1–3 times per week. This should continue.

**Create a web page.** The park should have either its own web page or an easy-to-find page on the town's website.

**Consider a name that reflects natural icons of the Eastern Shore.** Given that wildlife is a big draw to the park, think about a park name that reflects its natural and popular features, e.g., Berlin Turtle Park, Painted Turtle Park in Berlin, Green Heron Park in Berlin, Otter Park, Berlin Bird Park, Berlin Nature Preserve, etc.

**Host guided tours.** Conservation Community Consulting (CCC) or other for-profit entities could create a guided tour schedule surrounding local businesses adjacent to the property. CCC has already held five guided tours there which brought more than 60 visitors to the town. Other groups, such as the Tri-County Bird Club and Maryland Ornithological Society can be invited by the Town of Berlin to use the park for guided walks.



*Entrepreneurs could create a guided tour schedule at the park with local businesses as beginning and ending points. Conservation Community Consulting has already conducted “Beans, Birds, and Beer” tours there with Burley Oak Brewing and Urban Nectar.*

**Make the park available to groups.** Advertise that the park is accessible to groups to hold events, fundraisers, walks, bike rides etc. In these cases, the given entities do the marketing for you. The town should make it clear that the park is available and make sure it has the facilities to accommodate them. This gets folks to the park who might otherwise never come. Once familiar, they return.

**Improve signage.** The park should have a clear entrance sign on Old Ocean City Blvd and signage that directs visitors, where to park, what they can do at the park, where the trails are, etc. Signage visible from US113 should also be explored.



# COMPATIBLE USES

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**Limit motorized vehicle usage, especially in the woods.** The wooded wetlands on the property have been highly degraded from motorized vehicle use. This has caused invasive plant proliferation, hydrology alterations, sediment fluxes to Trappe Creek and Newport Bay, and has created substantial mosquito breeding habitat. The damage in the wet grassy areas directly behind the asphalt area will also encourage mosquito breeding, but is less onerous environmentally than the wetland destruction in the woods. The wetland restoration plan on p.3-4 in this proposal is designed to address these issues by improving water quality and wildlife habitat.



*Vehicle use should be prohibited in the woods to avoid scenes like this.*

**Explore bicycling trails in appropriate areas.** Most walking trails on this property could also be used for bicycling. This should be appropriately signed and road-marked to avoid collisions. Bicycling should be avoided in the wet woods on the west side of the property.



*Bicycling is an appropriate use on this property.*

**Maintain hiking trails.** Trails around the ponds exist but could be maintained in a more formal manner with shell, stone, wood, or more mowing. New trails along the railroad tracks and behind the upper ponds could give visitors more options. Naming the trails is also an effective way for the town to market them, pay for them, and for visitors to navigate them. See p.3-4.

**Promote sledding.** Folks love sledding on the hill near the park entrance after snow events. This is a great wintertime attraction and should be advertised and promoted as a relatively safe and fun way to enjoy the park.

**Build piers for fishing and wildlife viewing.** The upper ponds are full of pumpkinseeds, a native species of sunfish. The fish can provide hours of entertainment with a rod, bobber, and worms. However access to the ponds is difficult. To facilitate this, Berlin should consider building piers and cutting access points to the ponds. Although it is unclear if substantial fish populations inhabit the lower pond, access and piers can make for great viewing of wildlife. See map on p.3-4.



# INTERPRETATION AND RESTORATION BUDGET

This budget is a best guess based on our experience with a host of other similar projects and estimates from those who conduct this type of work. It does not include maintenance or potential sponsors of activities. This work lends itself well to grant funding and NRCS has already offered to do the design for the wetland restoration, meadow and tree planting, and basking platforms. The chart below includes what we have found to be reliable funders of these types of projects and whether they lend themselves to allowing for volunteer opportunities which we believe are important to have lasting stewardship of the park. Depending on their capabilities, Berlin Public Works may be able to do a substantial amount of the construction activities.

Project	Cost	Possible funding	Public Works assist?	Chance of Berlin having to fund	Volunteer help?
Restoration design	\$30,000	NRCS	no	low	no
Wetland construction	\$75,000	Chesapeake Bay Trust	yes	medium	no
Tree & meadow planting	\$5,000	Chesapeake Bay Trust	yes	low	yes
Trails	\$6,000	DNR, SHA	yes	high	yes
Nature playground	\$75,000	POS local side, Humphreys Foundation	yes	high	no
Bird boxes/ platforms	\$2,000	Scout Troops	yes	low	yes
Floating wetland islands	\$25,000	Chesapeake Bay Trust	yes	medium	yes
Interpretive panel design (6@32X48)	\$6,000	LESHC, MHAA, Humphreys Foundation	no	medium	no
Interpretive panel creation	\$8,400	LESHC, MHAA, Humphreys Foundation	installation	medium	no
Marketing	\$5,000	Worcester County, LESHC	no	medium	no
Pier creation (5)	\$38,500	DNR	yes	high	no
Total	\$275,900				

NRCS: Natural Resources Conservation Service  
 DNR: Department of Natural Resources  
 SHA: State Highway Administration  
 POS: Maryland Program Open Space  
 LESHC: Lower Eastern Shore Heritage Committee  
 MHAA: Maryland Heritage Area Authority

# WEB RESOURCES

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## Funders

[www.nrcs.usda.gov/wps/portal/nrcs/site/md/home](http://www.nrcs.usda.gov/wps/portal/nrcs/site/md/home)

[cbtrust.org/grants](http://cbtrust.org/grants)

[roads.maryland.gov/Index.aspx?PageId=98](http://roads.maryland.gov/Index.aspx?PageId=98)

[dnr2.maryland.gov/land/Pages/ProgramOpenSpace/home.aspx](http://dnr2.maryland.gov/land/Pages/ProgramOpenSpace/home.aspx)

[www.mdot.maryland.gov/newMDOT/Planning/Bike/Cycle\\_Maryland.html](http://www.mdot.maryland.gov/newMDOT/Planning/Bike/Cycle_Maryland.html)

[dnr.maryland.gov/ccs/Pages/funding/fundingopp.aspx](http://dnr.maryland.gov/ccs/Pages/funding/fundingopp.aspx)

[grants.maryland.gov/pages/foundationgrants.aspx](http://grants.maryland.gov/pages/foundationgrants.aspx)

[mht.maryland.gov/documents/PDF/grants/Grants\\_Funding\\_Sources.pdf](http://mht.maryland.gov/documents/PDF/grants/Grants_Funding_Sources.pdf)

[nonprofits.findthecompany.com/l/724300/Humphreys-Foundation-Inc](http://nonprofits.findthecompany.com/l/724300/Humphreys-Foundation-Inc)

[lowershoreheritage.org/index.php/LESHeritage/about\\_article/mini-grant-application](http://lowershoreheritage.org/index.php/LESHeritage/about_article/mini-grant-application)

## Providers

[www.nrcs.usda.gov/wps/portal/nrcs/site/md/home](http://www.nrcs.usda.gov/wps/portal/nrcs/site/md/home)

[www.earthscapeplay.com](http://www.earthscapeplay.com)

[www.floatingwetlandsolutions.com](http://www.floatingwetlandsolutions.com)

[www.facebook.com/ConservationCommunityConsulting](http://www.facebook.com/ConservationCommunityConsulting)

[www.facebook.com/Sun-Signs-268458329624](http://www.facebook.com/Sun-Signs-268458329624)

[rgmurphymarine.com](http://rgmurphymarine.com)



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**Remedial Investigation and Cost Estimate  
Former Waste Lagoons  
Former Tyson Foods Facility  
9943 Old Ocean City Boulevard  
Berlin, Maryland 21811**

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**LIST OF ACRONYMS AND ABBREVIATIONS**

AST	Aboveground Storage Tanks
ATC	Anticipated Typical Concentration
BOD	Biological Oxygen Demand
CTD	Conductivity, Temperature, and Density
CREC	Controlled Recognized Environmental Condition
DEM	Digital Elevation Model
EA	EA Engineering, Science, and Technology, Inc., PBC
ESA	Environmental Site Assessment
ft	Foot or Feet
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HREC	Historical recognized environmental condition
in	Inch or Inches
MDE	Maryland Department of Environment
Msl	Mean Sea Level
NAVD 83	North American Vertical Datum of 1983
NAD 88	North American Datum of 1988
NFRD	No Further Requirements Determination
NGS	National Geodetic Survey
PAH	Polycyclic Aromatic Hydrocarbon
REC	Recognized Environmental Condition
RI	Remedial Investigation
RTK	Real Time Kinematic
TSS	Total Suspended Solids
TKN	Total Kjehldahl Nitrogen
QA	Quality Assurance
QC	Quality Control

**LIST OF ACRONYMS AND ABBREVIATIONS CONTINUED**

USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
UST	Underground Storage Tanks
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compounds
VRS	Virtual Reference Station

## 1.0 INTRODUCTION

EA Engineering, Science, and Technology, Inc., PBC (EA) was contracted by the Town of Berlin to develop viable conceptual remediation approaches and conceptual level cost estimates to remove sediments that have accumulated within the waste lagoons of the former Tyson Foods Facility located at 9943 Old Ocean City Boulevard (Site) located in Berlin, Maryland 21811.

### 1.1 PURPOSE AND SCOPE

The scope of work for this remedial investigation (RI) was developed based on a review of available historic documents and environmental reports for the Site, as well as review of site investigations performed by EA in previous phases of the project. To further support the remedial cost assessment, EA performed an additional site investigation in March 2017. While previous environmental assessment sampling and analysis efforts did not identify significant environmental exposure concerns associated with the existing sediments within the lagoons, EA understands the historical uses of the lagoons present challenges to their potential reuse. The Town of Berlin may want to consider addressing the sediments within the lagoons before repurposing the lagoons for public recreation.

The Site has a recorded Activity and Use Limitation for industrial, commercial, and limited recreational use. The goal of the RI was to evaluate the characteristics of in-place sediments that have accumulated at the bottom of three engineered wastewater management lagoons located on the property for potential future use as a public recreation area.

Field activities conducted at the Site consisted of the following:

- Sediment probing was performed by EA to identify the elevation of the water surface and sediment surface, and the elevation of the firm subgrade material at 25 locations in the lagoons.
- Piston coring was utilized by EA to collect twelve (12) sediment samples and two duplicate samples from the wastewater management lagoons.
- Bathymetric and topographic surveys were performed by EA to characterize the morphology of the wastewater lagoons and the surrounding basin, and to estimate the volumes of the soft sediment overburden present in the lagoons.

This report provides a detailed synopsis of the sediment coring and probing, and bathymetric and topographic surveys results conducted during the March 2017 field event.

## 2.0 SITE AND PROJECT BACKGROUND

### 2.1 SITE LOCATION AND DESCRIPTION

The Site consists of three adjoining parcels of land located at 9943 Old Ocean Town Boulevard within Worcester County in Berlin, Maryland. Identified as Map 0025, Grid 0009, and Parcels 0052, 0057, and 0410, the Site is currently comprised of approximately 56.72 acres and is zoned I-2, heavy industrial and municipal. The Site location is illustrated in Figure 2-1. The Site is bordered by an on-ramp to Route 113 to the north, commercial properties to the south, Route 113 to the west, and a railroad track to the east.

The Site is located on the United States Geological Survey (USGS) Berlin, Maryland 7.5-minute topographic quadrangle. The elevation of the Site is approximately 25 ft above mean sea level (msl), with the exception of the lagoons. The nearest natural surface water feature is Kitts Branch which flows through the northern portion of the Site. The Site is relatively flat.

Review of the Web Soil Survey (United States Department of Agriculture, Natural Resources Conservation Service, <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>) indicates that the southwest portion of the Site is classified as an Urban Land Complex consisting of areas where much of the ground surface is covered with asphalt, concrete, buildings, or other impervious material. The majority of the southern portion of the Site is classified as the Mullica-Berryland complex, which is characterized by a 0 to 2 percent slope and is very poorly drained mucky, sandy, loam weathered from sandy eolian deposits and/or fluvio-marine sediments.

The remainder of the Site is classified as: the Urban land-Udorthents Complex, which is characterized by a 0 to 5 percent slope, are 50% Urban Land and 35% well-drained sandy loams weathered from fluvio-marine deposits; the Woodstown sandy loam, which is characterized by 2 to 5 percent slopes and are moderately well-drained sandy loams weathered from loamy fluvio-marine deposits; and the Udorthents, which is characterized by 0 to 5 percent slopes and are well-drained loamy soils weathered from fluvio-marine deposits.

### 2.2 SITE HISTORY

The Site operated as a poultry processing plant starting in the mid-1940s. In 1965, the Site was purchased by the Ralston Purina Company, which further developed the Site with construction of a poultry processing building, rendering plant addition, a scale house, a shop, an ice storage, additions to the plant, a garage/office space, a cooling shed, and an accessory structure to cover the wastewater treatment plant. Circa 1972, Chesapeake Foods, Inc. (which later became Tyson Foods, Inc.) purchased the Site, with further development that included construction of a new processing front, employee facility, office building, refrigeration facility, feather dryer enclosure, cooler expansion, 4-bay live haul building, cold storage cooler, lime silo, addition to the live haul shed, secondary clarifier for the wastewater treatment plant, and additions to the plant on Parcel 0057, and construction of a process water upgrade fire pump house with a 150,000-gallon tank on Parcel 0052. In 2005, Berlin Properties North, LLC purchased the Site which at the time also included Parcel 1705; however, Parcel 1705 was eventually purchased by the County Commissioners of Worcester County, Maryland in 2008. From 2008 through 2011, five

buildings on Parcel 0057 and the wastewater treatment structure on Parcel 0052 were demolished.

The Site was issued a discharge permit State No. 79-DP-0375 to discharge treated chicken processing and rendering wastes to Kitts Branch. The permit noted that storm water runoff did not enter the treatment system. The permit required testing for biological oxygen demand (BOD), total suspended solids (TSS), oil and grease, dissolved oxygen, residual chlorine, fecal coliform, pH, total kjehldahl nitrogen (TKN), nitrate, ammonia, and phosphate.

### 2.3 PREVIOUS ENVIRONMENTAL REPORTS

Prior environmental investigations are documented in the Phase I ESA (EA, June 2015). The most recent studies conducted by EA are discussed below.

#### Phase I ESA Former Tyson Foods Facility Berlin, Maryland June 2015

EA identified the following recognized environmental conditions (REC) and provided recommendations:

- Remnant unused material was identified in various outbuildings on the subject site, which included industrial process chemicals, compressed gas cylinders, and aboveground storage tanks (AST). A recommendation was made for removal/disposal of remnant materials.
- The underground storage tank (UST) removal cases and elevated levels of volatile organic carbons (VOC) identified in on-site wells are considered a historical recognized environmental condition (HREC). The UST cases were closed by MDE through removal actions or abandoning in place. The elevated VOCs were investigated as part of an area-wide impact investigation and determined not to be attributed to the subject site. A recommendation was made to revise the approved use category of the subject site.
- The subject site has a recorded Activity and Use Limitation for industrial use. The proposed future use of the project is recreational and, therefore, the Activity and Use Limitation must be revised to allow for the future proposed recreational use. EA recommended that the Scope of Work for additional sampling provided by MDE Voluntary Cleanup Program (VCP) in the December 22, 2005 letter be completed.

The findings listed above can be characterized as *de minimis* conditions, CRECs, HRECs, or RECs dependent on various factors related to whether or not the potential for an adverse environmental impact on the subject site exists. HRECs and RECs were identified based on past investigations and the proposed future use of the project site. Based on all findings in this Phase I ESA, additional investigations were recommended to support the planned approved recreational use category of the subject site.

### Phase II ESA Former Tyson Foods Facility Berlin, Maryland July 2015

EA performed a Phase II ESA to evaluate the potential for the historical site activities to have impacted the environmental integrity of areas of the site not addressed by previous investigations in order to meet the MDE requirements to revise the Activity and Use Limitation for proposed future recreational use. The results of the site investigation efforts confirmed the following:

- Concentrations of arsenic were reported slightly greater than the MDE Residual Soil Clean-up Standards throughout the site in surface and subsurface samples. However, no results were reported that exceeded the MDE anticipated typical concentrations (ATC).
- Benzo(a)pyrene and benzo(a)anthracene were reported greater than MDE Residential Soil Clean-Up Standards in a single surface sample located adjacent to the former maintenance room. Based on the results from prior investigations and the proposed recreational land use, the levels of PAHs observed are not anticipated to represent an exposure concern for the recreational user.
- E. coli and enterococci reported in surface water sample SW-03, located at the northernmost edge of the lagoons indicate an exposure concern associated with the recreational use of the lagoon water.

Based on review of the soil and groundwater analytical data, it appeared that there were no analytes of concern detected at concentrations in these matrices that would represent a human health concern for future recreational users of the site. However, concentrations of E. coli and enterococci reported at the northernmost edge of the lagoons indicated an exposure concern associated with the recreational use of the lagoon water. It should be noted that the MDE VCP determination is based solely on chemical exposure criteria and does not address physical or biological hazards.

### MDE VCP No Further Requirements Determination (NFRD) Letter May 2016

MDE determined there was no further requirements related to the investigation or remediation of controlled hazardous substances or oil identified at the subject site provided the property is used for unrestricted commercial (Tier 2B) or unrestricted industrial (Tier 3B) purposes or medium frequency public recreational area use (Tier 4B) and compliance is maintained with the land use requirement.

### 3.0 REMEDIAL SITE INVESTIGATION

EA performed a remedial site investigation between 27 March and 31 March 2017. The purpose of this investigation was to evaluate the characteristics of in-place sediments that have accumulated at the bottom of three engineered wastewater management lagoons located on the property (Figure 3-1). The data collected during the March 2017 field effort were used in conjunction with the existing data sets to support the development of cost estimates for several proposed remedial design options for the Site, provided in Appendix A.

#### 3.1 FIELD INVESTIGATION METHODS

The remedial site investigation effort consisted of the collection of sediment probe data and sediment core samples from pre-determined locations distributed throughout the three wastewater management lagoons. In addition, a bathymetric survey and upland topographic survey were performed in order to characterize the morphology of the lagoons and the surrounding basin, and ultimately develop a digital elevation model (DEM) of the Site. The combination of survey data and sampling data was used to support site planning and design efforts, evaluation of remedial options, and generation of the cost estimate.

##### 3.1.1 Precision Navigation and Horizontal Control

Precision navigation for the field investigation was provided by a roving Trimble R8S Global Navigation Satellite System (GNSS) receiver coupled with a Trimble TSC3 handheld controller. The unit provided horizontal positioning in the Maryland State Plane (FIPS 1900) coordinate system in the units of U.S. Survey Feet relative to North American Datum of 1983 (NAD 83). Precise elevation information relative to North American Vertical Datum (NAVD 88) was provided as well. Differential corrections for the satellite positioning data were received real time through a subscription to the KeyNetGPS Virtual Reference Station (VRS) network (<http://www.ketnetgps.com>). The KeyNetGPS network provided corrections output by the reference station located in Ocean City, Maryland (MDOC; 246516.4N, 1860282.5E); approximately 8 miles from the Site. Following corrector application, the positional information generated by the GNSS unit reliably provided a geodetic accuracy of 0.2 feet (ft) (5 centimeters) in the horizontal and vertical planes.

Prior to initiating the survey effort, two National Geodetic Survey (NGS) benchmarks located outside of the Site were identified as the cross-check marks to confirm geodetic accuracy for the field operation. The NGS benchmark HU0244 located in Berlin, Maryland was utilized to establish vertical control. The NGS benchmark SPEICHER located in Ocean City, Maryland provided horizontal and vertical control. Position comparisons between the published coordinates of the benchmarks and the observed readings of the GNSS unit were made prior to the commencement of the bathymetric and topographic surveys, and served as a quality control (QC) measure. The results of the QC check demonstrated the accuracy of the system, as well as the validity of the corrections produced by MDOC for use at the Site.



### 3.1.2 HYPACK Navigation and Data Acquisition Software

The positioning information provided by the roving GNSS receiver described above was ported directly to HYPACK navigation and data acquisition software running on a computer laptop onboard the vessel via serial connection. The data were transmitted as National Marine Electronics Association (NMEA) strings (i.e., GGA – position and accuracy, heading in degrees true, and ZDA – GPS time reference to Zulu Time or Universal Time Coordinated) providing time, position and vessel heading, and elevation.

HYPACK served as the primary survey management system; logging time, geographic position, and depth data continuously. It also provided a helmsman display, allowing the vessel operator to maneuver the vessel and associated sensors along the pre-determined survey lines. As the data were received in HYPACK, the geodetic coordinates were converted to Maryland State Plane coordinates in the units of U.S. Survey Feet in real time, based on NAD 83. The ellipsoidal height information from the GNSS unit was passed through the Continental United States 2012a (CONUS 12A) Geoid model that converted the information to elevation (orthometric height) tied to the vertical datum of NAVD 88 in real time.

### 3.2 SEDIMENT PROBE SAMPLING INVESTIGATION

EA conducted a series of sediment probes at 25 pre-determined locations within the three wastewater management lagoons between 30 March and 31 March 2017 (Figure 3-2). The probe data were used to identify the elevation of the water and sediment surfaces, as well as the elevation of the firm subgrade material at each location.

The Trimble R8S GNSS unit was mounted to the top of a fiberglass probe to provide horizontal and vertical positioning in the Maryland State Plane coordinate system (Figure 3-3). At each location, the probe was pushed into the sediment until refusal was met, or until the probe reached its full extent of 13.1ft. Three positional fixes were logged at each location: (1) water surface, (2) top of sediment, and (3) bottom of sediment. By obtaining three positional fixes, the water depth and overall thickness of the fine-grained sediment overburden was calculated for each location based on the difference of the various elevation values.

### 3.3 SEDIMENT CORE SAMPLING INVESTIGATION

The objective of the sediment coring effort was the collection of intact, cross-sectional samples in order to examine the sediment strata within the wastewater management lagoons. Twelve (12) locations established in a previous phase of the Site characterization were re-occupied for the collection of sediment core samples in order to sample the fine-grained material of concern (Figure 3-4). On 30 March and 31 March 2017, a 2.75-inch diameter piston corer was utilized by EA to collect 12 core samples and two duplicate core samples throughout the lagoons to a maximum depth of 5 ft below the sediment surface (Figure 3-5). Sediment core samples included:

- Four samples located within the north lagoon (SC-1N; SC-3N; SC-5N; SC-9N)

- Four samples located within the middle lagoon (SC-2S; SC-5S; SC-8S; SC-9S)
- Two samples located within the western half of the south lagoon (WWP-1; WWP-2)
- Two samples located within the eastern half of the south lagoon (WWP-3; WWP-4)

Additionally, two duplicate core samples were collected from the western half of the south wastewater lagoon (WWP-1.1; WWP-2.1). Sampling locations were located via GNSS by EA prior to sampling and are presented in Figure 3-4.

The hand-deployed piston corer was utilized to push a 5-ft long, clear Lexan tube into the upper sediment column and withdraw cross-sectional samples. The corer was mounted to the end of a 10ft aluminum rod, which facilitated the driving of the Lexan tube into the sediment column via direct push, as well as withdrawal and recovery of sediment samples. Upon recovery, each core sample was capped, taped, labeled, and stored at 4° Celsius until processed.

### 3.4 BATHYMETRIC AND TOPOGRAPHIC SURVEYS INVESTIGATION

EA performed a single-beam bathymetric survey and upland topographic survey between 27 March and 31 March 2017 to characterize the morphology of the lagoons and the surrounding basin. Due to the shallow water depths and varying water basin sizes at the Site, EA utilized two vessels to complete the survey effort. The motor vessel (M/V) *Shocker*—a shallow draft, 17-ft Jon boat—served as the primary survey platform for the field effort in the north and middle lagoons (Figure 3-6). Work performed in the south wastewater lagoon was conducted using a smaller, 14-ft Jon boat due to limited access and the frequent need to launch and recover the vessel to cover the entire lagoon.

The hydrographic survey operation involved the collection of data over a total of 83 main-scheme survey lines, oriented east-west in the middle wastewater lagoon and north-south in the north wastewater lagoon, and spaced at 25-ft intervals. In addition, a series of 13 cross-check survey tie lines oriented perpendicular to the main-scheme lines were occupied, providing an added level of quality assurance (QA) following the post-processing. Depth soundings were collected along each of the main-scheme lines, as well as the tie lines, ultimately yielding elevation cross-sections every 25-ft.

The bathymetric survey was conducted in accordance with the U.S. Army Corps of Engineers (USACE)-approved methods described in the USACE Hydrographic Survey Manual EM 1110-2-1003 (USACE, 2013). The surveying methodology was verified to yield the necessary accuracies in the horizontal and vertical planes to support the selection and planning of one or more remedies for the Site. In addition, cross-check comparisons were made between the bathymetric and topographic surveys at overlapping points. These comparisons demonstrated strong agreement between the two data acquisition methodologies and served as a QA measure to further verify the validity of the processed bathymetric and topographic data.

#### 3.4.1 Bathymetric Survey Element

Bathymetric surveying is a technique used for characterizing and mapping underwater topography. A down-looking sonar transducer is mounted to a vessel via a mounting system or

directly to the vessel's hull. As the vessel moves across an area, the transducer emits pings at a specific frequency and rate. The individual acoustic pings make contact with the bottom and are reflected back to the transducer. The two-way travel time between the transmit and return pulses is recorded by the instrument, then divided in half and compared to the sound velocity within the water column to determine a depth value. Following data acquisition, the acoustic soundings are merged together to form a complete surface of the surveyed area.

The March 2017 survey utilized a dual frequency [200 kilohertz (kHz) and 24kHz] transducer, which allowed distinct sediment layers to be profiled based on differences in density. Higher frequency, shorter wavelength acoustic pulses attenuate rapidly in the water column, but also reflect off the first density interface encountered (sediment surface). Lower frequency pulses are longer in wavelength and have the ability to penetrate through the sediment surface and detect an acoustic reflector deeper in the sediment column. This acoustic reflector is commonly a density interface within the sediment column, which typically represents a change in stratigraphy or a buried object.

### ***Bathymetric Data Acquisition***

A CEE Hydrosystems CEESCOPE single-beam survey fathometer interfaced with a dual frequency (200 kHz and 24 kHz) transducer was used to collect depth soundings over each survey line. The high frequency (200 kHz) sonar reflected off the sediment surface and provided an instantaneous measurement of water depth. The low frequency (24 kHz) sonar penetrated through the fine-grained surficial sediments, striking the firmer subgrade below, providing an elevation of the subgrade material. The transducer was pole-mounted to the starboard side of the vessels and set at a fixed depth below the water's surface (draft). The raw depth soundings obtained by the CEESCOPE were ported directly to HYPACK, where they were time-tagged and merged with positioning information; creating continuous depth records along the survey track. These data were then stored for post-processing and analysis at the conclusion of the survey.

Water column sound velocity is a function of water density, which varies in a freshwater body with temperature. To yield accurate sound velocity measurements throughout the survey, the water column was profiled at the start and end of each survey day using a Yellow Spring Instruments (YSI) CastAway Conductivity, Temperature, and Density (CTD) probe. Prior to deployment, the internal GPS receiver tracked satellites and achieved a precise geographic position. The instrument was then hand-lowered into the water, collecting measurements as it moved through the water column, and recovered once the sediment surface was reached. The data collected by the CTD probe were archived for inclusion in post-processing of the bathymetric data.

The use of VRS Real Time Kinematic (RTK)-corrected GNSS data allowed HYPACK to record water surface elevations relative to NAVD 88 as the survey progressed, which yielded lagoon bed elevation data in real time when coupled with the bathymetric soundings. As an added QA measure, EA deployed two Onset HOBO U20 pressure sensor/water level recorders in the north and middle lagoons. The units were deployed on 28 March 2017 and left undisturbed until their recovery on 31 March 2017. The units recorded absolute pressure and bottom water temperature

observations on a 6-minute interval for a period of 4 days. Upon recovery, the data were downloaded, verified for validity, and stored for processing.

### ***Bathymetric Data Processing***

Upon completion of the survey, all of the raw depth soundings obtained along the main-scheme and tie lines were reviewed, corrected for water column sound velocity, and then normalized to NAVD 88 in HYPACK's single-beam editor module. Erroneous data points associated with cavitation in the water column, insufficient water depth, or suspect data points were flagged and removed from further processing and eventual data output. As a QC measure, the main-scheme and tie line soundings were overlaid in HYPACK, and values were compared at numerous crossings to verify all correctors were properly applied and that there was strong agreement between the overlapping soundings. The cross-check comparisons showed consistent agreement between the main-scheme and tie lines.

At the conclusion of the post-processing effort, the bathymetric survey data set was compiled into a comprehensive XYZ text file consisting of X and Y position coordinates referenced to Maryland State Plane and positive elevations (Z) referenced to NAVD 88. The first Z value output was the high frequency (200 kHz) transducer output used to track the sediment surface and represent the lagoon bed elevation. In addition, a second Z value representing the elevation of the hard subgrade material detected by the low frequency (24k Hz) pulse was output.

### **3.4.2 Topographic Survey Element**

In order to develop a complete DEM of the Site, a series of land-water interface transects were performed along the margins of each lagoon. Individual positional fixes were logged above the waterline using the Trimble R8S GNSS unit and collected high-resolution elevation measurements along all accessible stretches of shoreline within the project area.

#### ***Topographic Data Acquisition***

Individual transect lines spaced at 100-ft intervals and oriented perpendicular to the banks of each lagoon (shore normal) were occupied with a minimum of 10 positional fixes recorded along each line. The GNSS receiver was mounted to a surveying rod and walked along each transect to obtain position and elevation data from the water's edge, up the bank, and extending to the tree line. A 6.562ft elevation corrector was applied the data in real time by the handheld Trimble TSC3 controller to correct for the height added by the pole-mount. In addition, point measurements were collected using this approach to supplement bathymetric soundings in areas where shallow water depths prevented the collection of valid acoustic data.

#### ***Topographic Data Processing***

Following the survey effort, the topographic data were compiled into a comprehensive XYZ text file consisting of X and Y position coordinates referenced to Maryland State Plane and positive elevations (Z) referenced to NAVD 88. The data set was exported to a Geographic Information

System (GIS) database, where it was merged with the bathymetry data and further processed to support gridding routines and serve as a component of the DEM for the Site. The finalized DEM was ultimately used to generate contour maps and facilitate description of bottom topography within the survey area.

### **3.4.3 Geographic Information System**

The bathymetric survey covered an area of approximately 26 acres of lagoon bed. The data from the survey consist of a series of XYZ files. When processed together, a comprehensive view of the lagoon bed morphology was developed. The final element of the bathymetric and topographic data processing included the output of the geo-referenced XYZ files for incorporation into a geodatabase and use in a GIS framework. The individual bathymetric survey lines and topographic transect lines were combined in ArcGIS to create a digital, geo-referenced elevation surface of the study area. Merging the data sets resulted in the development of a seamless DEM covering the upland, shoreline, and in-water areas of the Site.

The combined data set of bathymetric soundings and topographic measurements were subjected to a series of gridding routines, which were then used to develop raster surfaces or elevation models. The models were then used to derive information regarding water depth within each pond, elevation of the sediment surface, as well as the elevation of the underlying strata. Contour, or isopach, maps of the surveyed areas were then produced to illustrate the Site's morphology. These results were used to inform the remedial design efforts and to estimate the volumes of soft sediment present in the survey area.

## 4.0 RESULTS

Figure 4-1 displays the seamless DEM developed from the merged bathymetric and topographic data sets. When normalized to a surface water elevation of 26.3ft (NAVD 88) for the north and middle lagoons and 31.5ft for the south lagoon, a map of water depths within each lagoon was produced (Figure 4-2). Figure 4-3 illustrates the elevation measurements of the subgrade material as detected throughout the survey area using the low frequency (24 kHz) data. Comparison between the elevation of the sediment surface to that of the subgrade material at depth within each lagoon yielded a model of soft sediment thickness within each basin (Figure 4-4). This data product was then used to calculate volume estimates for the amount of material that would be encountered and/or managed as part of the various remedial alternative presented in Section 5.0.

Figures 4-5 and 4-6 provide cross-sectional representations of the stratification of sediment present in the lagoons. The bottom-most layer represents the firm subgrade material. The soft sediment layer overlays the subgrade layer in varying thicknesses. The uppermost layer represents the water column.

A total of 25 sediment probes were conducted throughout the survey area. The probe met refusal at 21 locations distributed throughout the wastewater lagoons, and was pushed to extent (~13ft depth) at four locations in the south wastewater lagoon. The data collected were utilized in determining the volume of the soft sediment layer present in the lagoons. Table 4-1 provides the measured depths obtained at each location.

A total of 12 sediment cores, and two duplicate cores, were collected during the field investigation. The coring locations were distributed among the wastewater lagoons, providing a cross-sectional representation of the subsurface lithology. Table 4-2 provides the locations and measured recovery of each sediment core. A photographic record of all collected core samples is provided in Appendix B.

### 4.1 NORTH WASTEWATER LAGOON

#### 4.1.1 Bathymetric and Topographic Surveys Results

Evaluating the high frequency soundings, the north wastewater lagoon exhibited water depth ranges from zero (26.3ft NAVD 88) along the margins to 3.5ft (23.5ft NAVD 88) near the center of the basin. The shallow, nearshore extents around the perimeter of the lagoon gradually slope to the deepest portion in the center of the lagoon, forming a bowl-shaped basin (Figure 4-1). The deepest portion of the lagoon measures 450ft wide at its center, and 600ft long. The use of the low frequency (24 kHz) data provided insight into the elevation of the denser subgrade material present in the lagoons (Figure 4-3). The north lagoon exhibited a subgrade material elevation range from 21ft to 25ft (NAVD 88). It is assumed that the subgrade material is comprised of ambient soils, similar in composition to those described in Section 2.1.

Figure 4-4 illustrates the distribution of soft sediment throughout the wastewater lagoons. As described in Section 3.4, the high and low frequencies of the sonar transducer detected two distinct sediment layers. The high frequency return provided elevation measurements of the soft sediment surface, while the low frequency return penetrated through the soft sediment to provide elevation measurements of the firm subgrade layer. The high frequency return was subtracted from the low frequency return, and the difference represented the estimated thickness of soft sediment present in the lagoon. The north lagoon exhibited a soft sediment thickness range from near zero at the margins to approximately 4.5ft. The thickest deposits of soft material were present along the northwestern margin, as well as in the southeastern corner of the lagoon. A series of in-filled pits were detected adjacent to the shoreline, extending from the northern-most point of the lagoon to the shoreline surrounding the small water treatment wells located between the north and middle lagoons.

The estimated volume of soft sediment present in the north lagoon was calculated in order to determine remedial design options for the Site. As described above, the soft sediment thickness was estimated by measuring the difference between the high and low frequency returns of the sonar. The total thickness represented the total soft sediment volume, which was calculated as 14,383 cubic yards.

Moving from the margins to the center of the basin, the water depth increased, and the apparent thickness of the soft sediment deposits decreased to values between 0.5ft and 1.0ft. The pattern of soft sediment distribution in the north lagoon indicated that it was not the primary placement area for wastewater. Wastewater was initially pumped into the middle lagoon, where most of the sediment settled out of suspension due to the low energy environment. Only a small percentage of the finer-grained sediment that could remain in suspension was ultimately transported into the north lagoon where it eventually settled as bedded material.

The distinct contrast between the topographic and bathymetric data is illustrated in Figure 4-1. The dirt road located along the perimeter of the Site is clearly visible due to its elevation, ranging from 29ft to 36ft (NAVD 88). The road outlining the north and middle lagoons is approximately 3ft higher in elevation than the surface water level of both lagoons. The road surrounding the south lagoon displayed the highest elevation, ranging from 34ft to 36ft (NAVD 88); approximately 5ft higher in elevation than the surface water level of the south lagoon.

The Site was constructed using a system of engineered berms, with all land outside of the perimeter displaying lower elevations. Topographic data points were obtained around each lagoon and along the southwestern extent of the Site, in close proximity to the former wastewater holding tank. Elevations of the berms ranged from 23.5ft at the base to 36ft (NAVD 88) at the edge of the south lagoon (Figure 4-1). However, the elevation of the roadway surrounding the north and middle lagoons was commonly 30ft (NAVD 88).

#### **4.1.2 Sediment Probe Results**

Nine (9) sediment probes were conducted in the north wastewater lagoon, with three elevations recorded at each location: (1) water surface, (2) top of sediment, and (3) bottom of sediment.

Refusal was met at all nine (9) probe locations, verifying the presence of a firmer subgrade. The measured elevations of the firm subgrade exhibited small variances between probe locations (Figure 4-3). The greatest variances were:

- Probe location 4N exhibited the highest firm subgrade elevation at 22.3ft (NAVD 88).
- Probe location 1N exhibited the lowest firm subgrade elevation at 21.1ft (NAVD 88).

The estimated depth of firm subgrade at each location was calculated using the measured elevations of the soft sediment and firm subgrade. Table 4-1 provides the water depth, firm subgrade depth, and estimated thickness of soft sediment at each probe location calculated using the measured elevations.

#### **4.1.3 Sediment Core Results**

Sediment was collected at four locations distributed throughout the north wastewater lagoon. The cross-sectional samples were collected from the sediment surface to a maximum depth of 5ft. The core penetration/recovery depths below the sediment surface ranged from a minimum of 1.4ft (16.5 inches [in]) in length to a maximum of 2.75ft (33in). Sediment recovery by location is provided in Table 4-2.

The soft sediment comprised of sandy silt was present at varying thicknesses in all four sediment samples, ranging from zero to 2.75ft (Table 4-2). An underlying layer of a firm, white/grey material was present in three of the samples. This material was presumed to be the firm subgrade verified by the sediment probe effort. The sediment sample obtained at location 3N did not capture the firm subgrade, and was the only sample in the north lagoon to present a strong odor upon core collection.

#### **4.1.4 Combined Bathymetric and Sediment Probe Results**

The sediment probe results were utilized as a QA check to verify the validity of the bathymetry data. Figure 4-3 illustrates the firm subgrade elevations detected by the low frequency sonar. The elevation of this same layer measured at each sediment probe location is labeled on the figure as well, allowing for a clear comparison to be made between the bathymetry data and the probe data. In the north lagoon, the firm subgrade elevation of the 9 probe locations ranged from 21.1ft to 22.3ft (NAVD 88), and the surrounding basin elevation ranged from 21ft to 23.5ft (NAVD 88). The comparisons made at each location in the north lagoon showed consistent agreement between the bathymetry and probe data.

Similarly, the estimated thickness of soft sediment calculated at each probe location is labeled on Figure 4-4. Comparisons were made between the thickness calculated using the bathymetry data and the labeled thickness at each probe location. The probe location thickness ranged from 2.19ft to 3.38ft, and the surrounding basin thickness ranged from 1ft to 4ft.



## 4.2 MIDDLE WASTEWATER LAGOON

### 4.2.1 Bathymetric and Topographic Surveys Results

Evaluating the high frequency soundings, the middle wastewater lagoon displayed water depth ranges from zero (26.3ft NAVD 88) near the margins to 1.5ft (25.5ft NAVD 88) near the center of this water body (Figures 4-1 and 4-2). In contrast to the north lagoon, the bed in the middle lagoon exhibited a relatively flat, featureless topography when viewing the 200 kHz data. The lower frequency, 24 kHz data suggested that the subgrade material was present at elevations ranging from 19.5ft to 24.5ft (NAVD 88) (Figure 4-3).

Subtracting the high frequency return from the low frequency return resulted in an estimated thickness of the soft sediment layer present in the middle lagoon (Figure 4-4). The lagoon exhibited soft sediment thickness ranging from 1.0ft to 6.0ft. Similar to the north lagoon, series of pits were present along the nearshore areas of the middle lagoon, which have been subjected to the highest amounts of in-filling over time. As a result, the greatest volume of soft sediment was detected in these nearshore areas, decreasing in thickness to an average of 4ft in the approximate center of the water body.

The estimated volume of soft sediment present in the middle lagoon was calculated in order to determine remedial design options for the Site. As described above, the soft sediment thickness was estimated by measuring the difference between the high and low frequency returns of the sonar. The total thickness represented the total sediment volume, which was calculated as 66,173 cubic yards.

In general, it appears that the middle lagoon basin has in-filled significantly with soft sediment over time. When first constructed, the north and middle lagoons were most likely established at the same elevation and exhibited similar bowl-shaped basins. Over time, the soft sediment deposited into the lagoon filled the basin, reducing the appearance of the bowl-shape and flattening the lagoon bed.

In addition to displaying the thickness of soft sediment present in the wastewater lagoons, Figure 4-4 provides insight into the behavior of the sediment as it was discharged into the lagoons. The wastewater and sediment were discharged directly into the middle lagoon, and moved into the north lagoon via the small opening on the eastern side of the Site. The outlet into the north lagoon behaved similarly to a river outlet; a small delta feature was formed by the sediment deposition as material was transported between the middle and north lagoons.

### 4.2.2 Sediment Probe Results

Eleven (11) sediment probes were conducted in the middle wastewater lagoon. Three elevations were recorded at each location: (1) water surface, (2) top of sediment, and (3) bottom of sediment. Refusal was met at all 11 probe locations, verifying the presence of a firmer subgrade. The measured elevations of the lagoon bed and firm subgrade exhibited small variances between probe locations (Figure 4-3). The greatest variances were:

- Probe location 11S exhibited the highest firm subgrade elevation at 22.1ft (NAVD 88).
- Probe location 7S exhibited the lowest firm subgrade elevation at 20.3ft (NAVD 88).

The estimated depth of firm subgrade at each location was calculated using the measured elevations of the soft sediment and firm subgrade. Table 4-1 provides the water depth, firm subgrade depth, and estimated thickness of soft sediment at each probe location calculated using the measured elevations.

#### 4.2.3 Sediment Core Results

Sediment was collected from four locations in the middle wastewater lagoon. The cross-sectional samples were collected from the sediment surface to a maximum depth of 5ft. The cores ranged from a minimum of 1.75ft (21in) in length to a maximum of 2.54ft (30.5in). Sediment recovery by location is provided in Table 4-2.

The soft sediment comprised of sandy silt was present at varying thickness in all samples, ranging from zero to 2.54ft (Table 4-2). An underlying layer of a firm white/grey material was present in three of the samples. As in the north lagoon, this material is presumed to be the firm subgrade material verified by the sediment probe effort. The sediment sample obtained at location 9S did not capture the firm subgrade, and was the only sample in the middle lagoon to present a strong odor upon core collection.

#### 4.2.4 Combined Bathymetric and Sediment Probe Results

The sediment probe results were utilized as a QA check to verify the validity of the bathymetry data. Figure 4-3 illustrates the firm subgrade elevations detected by the low frequency sonar. The elevation of this same layer measured at each sediment probe location is labeled on the figure as well, allowing for a clear comparison to be made between the bathymetry data and the probe data. In the middle lagoon, the firm subgrade elevation of the 11 probe locations ranged from 20.3ft to 22.1ft (NAVD 88), and the surrounding basin elevation ranged from 19.5ft to 22ft (NAVD 88). The comparisons made at each location in the north lagoon showed consistent agreement between the bathymetry and probe data.

Similarly, the estimated thickness of soft sediment calculated at each probe location is labeled on Figure 4-4. Comparisons were made between the thickness calculated using the bathymetry data and the labeled thickness at each probe location. The probe location thickness ranged from 3.03ft to 4.95ft, and the surrounding basin thickness ranged from 3.5ft to 5ft.

### 4.3 SOUTH WASTEWATER LAGOON

#### 4.3.1 Bathymetric and Topographic Surveys Results

Evaluating the high frequency soundings, the south wastewater lagoon exhibited water depth ranges from zero (31.5ft NAVD 88) near the margins to 11ft (20ft NAVD 88) near the lagoon center. In contrast to the north and middle lagoons, the south lagoon exhibits a strong vertical profile along its perimeter (Figure 4-1 and 4-2). Additionally, the south lagoon sits at a higher elevation than the north and middle lagoons and was established at a lower elevation than the north and middle lagoons. The topographic coverage adjacent to the south lagoon displayed an elevation of 23.5ft (NAVD 88) at its lowest point; 3.5ft higher than the lowest elevation present in the south lagoon (Figure 4-1). The 24 kHz data exhibited a firm subgrade elevation ranging from 19ft to 30.5ft (NAVD 88).

In contrast to the north and middle lagoons, the difference between the high and low frequency soundings was very small, excluding the nearshore extents along the lagoon perimeter, indicating only a thin layer of soft sediment overburden. The thickness ranged from <0.5ft to 1.0ft in a majority of the pond. Similar to the north and middle lagoons, the thickness was highest in proximity to the banks due to the series of pits that were apparently dug during construction. The greatest concentration of the deeper pits was in the western half of the south lagoon, displaying soft sediment thickness values ranging from 0.5ft to 3.5ft. In contrast, the pits in the eastern portion contained sediment thicknesses ranging from 0.5ft to 2.0ft.

Since the south lagoon presented a very thin layer of soft sediment in comparison to the north and middle lagoons, an estimated volume of soft sediment was not calculated. However, in order to determine remedial design options, the water volume for the south lagoon was calculated, and measured approximately 49,447 cubic yards. In addition, the total capacity of the lagoon was calculated to estimate holding potential, and measured approximately 78,200 cubic yards.

#### 4.3.2 Sediment Probe Results

Five (5) sediment probes were conducted in the south wastewater lagoon. Three elevations were recorded at each location: (1) water surface, (2) top of sediment, and (3) bottom of sediment. Four of the probe locations did not meet refusal due to the probe meeting its full extent (~13ft) and unable to advance further (Table 4-1). Refusal was met at one probe location:

- Probe station 1W exhibited a firm subgrade elevation of 19.8ft (NAVD 88) (Figure 4-3).

The estimated depth of firm subgrade at each location was calculated using the measured elevations of the soft sediment and firm subgrade. Table 4-1 provides the water depth, firm subgrade depth, and estimated thickness of soft sediment at each probe location calculated using the measured elevations.

### 4.3.3 Sediment Core Results

Sediment was collected from four locations in the south wastewater lagoon. The cross-sectional samples were collected from the sediment surface to a maximum depth of 5ft. The core penetration depths range from a minimum of 0.2ft (2.25in) in length to a maximum of 3.02ft (36.25in). Sediment recovery by location is provided in Table 4-2.

In contrast to the north and middle lagoons, the layers of sediment captured in the samples obtained in the south lagoon were not clearly stratified. The cores presented a varied lithology, containing layers of sediment ranging in grain size, composition, and color (Table 4-2). The sediment sample obtained at location WWP2 exhibited gas pockets within the layers of soft sediment, most likely indicating the presence of methane below the sediment surface. The samples captured in the western half of the south lagoon displayed the most varied stratification and lithology. The two samples from the eastern half were composed of the firm white/grey material.

### 4.3.4 Combined Bathymetric and Sediment Probe Results

As described in Section 4.3.2, the sediment probe only met refusal at one location in the south lagoon. The firm subgrade elevation measured as 19.8ft (NAVD 88) was compared to the surrounding basin, which ranged from 19ft to 21.5ft (NAVD 88) (Figure 4-3). This comparison served as a QA check to verify the validity of the bathymetry data.

The estimated thickness of soft sediment was calculated at the one probe location that met refusal. The soft sediment layer measured 1.4ft thick, and the surrounding basin thickness ranged from 0.5ft to 1ft.

## 5.0 DISCUSSION

The results of the field investigation were used to estimate volumes of the soft sediment overburden present in the lagoons and were used as the basis for developing remedial design alternatives. Potential remedial design efforts require the removal of this sediment prior to any public site usage. The sediment volume was estimated by determining the difference between the high frequency acoustic returns and the low frequency acoustic returns. The high frequency transducer recorded the elevation of the sediment surface, and the low frequency transducer recorded the elevation of the hard subgrade beneath the sediment surface. The difference calculated between the separate returns represented the thickness of soft sediment.

Figure 4-4 displays the estimated volume of soft sediment thickness present in the lagoons. The sediment ranges in thickness from 0.5ft to 5.5ft in the north and middle wastewater lagoons, and from zero to 2.0ft in the south wastewater lagoon.

The middle lagoon exhibits a greater estimated volume than the north lagoon (Figure 4-4). The thickness ranges from 3.5ft to 5.5ft, and the total volume was calculated as 66,173 cubic yards. The sediment thickness in the north lagoon ranges from 0.5ft to 4.0ft, and the total volume was calculated as 14,383 cubic yards.

A volume calculation was not performed for the south wastewater lagoon due to the negligible amount of soft sediment present. This lagoon would potentially be drained and utilized as a holding tank for material removed from the north and middle wastewater lagoons. The total volume of the lagoon was calculated to determine potential holding capacity and measured 78,200 cubic yards.

Table 5-1 provides a summary of the RI findings for each wastewater lagoon.

### 5.1 TECHNOLOGY SCREENING AND REMEDIATION ALTERNATIVE DEVELOPMENT

Two remediation alternatives to address sediment in the wastewater lagoons were developed according to the process described below. Each of the two remediation alternatives integrate anticipated means and methods of construction to implement the project, and includes detailed conceptual cost estimates to support the Town of Berlin's (Town) ongoing planning for the Site. The two alternatives result in different outcomes for the wastewater lagoons (primarily for the south wastewater lagoon) and the final disposition of the dredged sediment, and each alternative can be compared in terms of both the distinguishing factors in technical approach that may lend one alternative to be preferable to the Town than the other, as well as differences among the estimated costs. The detailed cost estimates are provided in Appendix A. The process to determine the major components for remediation alternatives that would be considered most likely to achieve success, involved a focused screening of candidate technologies for sediment removal, dewatering, and disposal. For the purpose of this evaluation, "Most likely to achieve success" is broadly defined as meeting these project objectives:

- Compatibility with Town’s proposed future land-use for the Site as a public recreation area;
- Effectiveness in removal of process residuals from the lagoons, referred to generally as “sediment”,
- Technical and administrative feasibility to implement (e.g., availability of contractors with requisite experience, availability of equipment and materials, permitting implications and public acceptance); and
- Cost-effectiveness of approach.

Technologies for sediment removal, dewatering, and disposal were combined based upon these stated objectives, available site information and generalized assumptions for sediment properties, and EA’s experience with similar projects. Technologies were then evaluated based upon two main criteria: general effectiveness and the ability to implement the technology, and expected relative cost. Table 5-2 below provides the qualitative screening evaluation of technologies in terms of high, medium, or low ranking. A “low to medium” or “low” overall ranking is eliminated from consideration, while “medium to high” or “high” overall ranking is retained for further consideration in developing the remediation alternatives for more in-depth evaluation and cost estimating.

In general, the process of removing sediments from any water body requires three primary tasks that are evaluated by the following categories: (1) removal of sediment, (2) dewatering of sediment, and (3) disposal of sediment. Technologies assessed for each task are commercially available and are further explained below:

#### **Removal:**

- In-dry excavation: This process includes dewatering lagoons by pumping out the water, treating water to remove suspended solids, and discharging it in accordance with the existing NPDES permit. This avoids removal of sediment through the water column as with dredging methods. Assuming appropriate geotechnical stability of the subsurface materials, direct access to the sediment is subsequently provided for equipment to remove and transport by truck, conveyor, or by additional handling to an adjacent dewatering area.
- Mechanical dredging: This method of dredging involves the use of barge-based equipment (i.e., clamshells and buckets, backhoes, bucket ladder dredges) to remove sediment to be transported by a separate barge to offload, or otherwise allow dredged material to be transferred to an adjacent dewatering area.

- Hydraulic dredging: This method of dredging involves the use of hydraulic pumps to remove sediment as a dredged material slurry, and transport by pipeline to an adjacent dewatering facility.

**Dewatering:**

- Gravity dewatering using drying agents: Drying agents or amendments such as lime, Portland cement, or iron salts are added to the dredged material to allow for better drying by absorbing water. This technology applies to sediment that is removed by in-dry or mechanical dredging methods whereby the dredged material is near the *in situ* moisture content. Dewatering methods may include gravity drainage (takes significant time), air drying with overturning of the material in stockpiles, and/or use of drying agents or amendments to eliminate free water that does not gravity drain. Some additives will also increase the strength and geotechnical suitability of the dredged material for beneficial reuses.
- Geotubes: This method of dewatering consists of three stages: (1) containment, (2) dewatering, and (3) consolidation. The dredged material is pumped into the tube in a containment facility. In the second stage, all free water is allowed to drain out of the pores of the geotextile fabric. In the third stage, after all water has been removed, the soil is dried out for final transport off-site.
- Mechanical/ belt presses: This method of dewatering involves the use of a belt filter press, in which the waste material is squeezed to remove moisture and create a dewatered product. A plate-frame filter press involves pumping the dredged material slurry inside filters, which similarly uses pressure to force water from the pore space between fine-grained sediment particles. Use of mechanical dewatering methods such as these also include complementary steps in the process to remove some materials prior to reaching the presses, such as debris and coarse material screens, hydroclones or sand separation screens, and polymer injection for fine-grained sediment coagulation.

**Disposal:**

- On-site management: This method of disposal involves the implementation of a designated containment area within the extents of the project site, namely the south lagoon. The dredged material is contained and dewatered within the available volume of the south lagoon, capped with a low permeability layer of soil to limit surface water infiltration into the contained sediment.
- Beneficial reuse: This method of dredged material management is appropriate when a material is not regulated as industrial waste, which involves processing to the extent necessary to meeting the specifications for use, such as debris removal, dewatering, and if

needed using amendments to improve geotechnical suitability for handling, transporting, and placing the materials, such as reuse as upland fill, landfill daily cover, or similar options that are lower in cost than landfill disposal.

- Landfill daily cover: If the dredged material meets the specifications for reuse and appropriate timing for a given landfill's operations, it may be accepted by a landfill for covering wastes contained in disposal cells.
- Landfill cell disposal: If the dredged material does not meet the specifications, such as geotechnical suitability for reuse as daily cover, it will be placed as part of the waste materials in the landfill cells and therefore be subject to a fee for disposal.

**Table 5-2: Technology Screening Evaluation for Remedial Alternatives**

Technology Category	Technology	General Effectiveness and Implementability	Expected Relative Cost*	Screening Outcome
<b>Removal</b>	In-dry excavation	Low – requires full dewatering of lagoons, the management, treatment, and discharge of a significant quantity of impacted water, and creation of access ramps and roads into lagoons to remove sediment (subsurface soil conditions below lagoons must be suitable for safely supporting equipment and personnel); the very soft sediment conditions in middle lagoon would not support construction equipment or efficient sediment removal using conventional excavation equipment, i.e., low technical feasibility; this also would include disposal of water, requiring a possible revision to the existing discharge permit and possibly water treatment, which is not required for other approaches.	Low	Eliminated (low)
	Mechanical dredging	Low to Medium – soft sediment conditions, particularly in middle lagoon, which may include sediment conditions that are similar to a slurry, combined with the limited depths of sediment removal above sand, reduces effectiveness of this technology. Additionally, dewatering and water treatment options are less compatible	Medium	Eliminated (low to medium)



		with approaches that allow direct recycling of water back to the lagoons.		
	Hydraulic dredging	High – generally preferable for soft sediment conditions in the lagoon lagoons; additionally, water can be managed cost-effectively by recycling water used for dredging back into the lagoons; hydraulic dredging in industrial lagoons and water treatment plants has prior precedent.	High	Retained (high)
<b>Dewatering</b>	Gravity dewatering using drying agents	Low to Medium – for saturated sediment dewatering by gravity drainage requires significant time without taking steps to enhance drainage and/or improve engineering properties such as strength; use of drying agents to such as lime, cement, or absorbents would be required at potentially significant quantities to allow transport and disposal, as well as improved geotechnical suitability for low cost disposal or some beneficial reuse options.	Low	Eliminated (low to medium)
	Geotubes	Medium to High – technology is commonly used for lagoon sludge dewatering (at least one other Tyson plant has utilized geotubes for dewatering process residuals – Attachment B is included for reference purposes courtesy of Tencate and WaterSolve); requires use of polymers for technical feasibility and to improve dewatering time; requires use of experienced technicians.	Medium	Retained (medium to high)
	Mechanical presses/ belt presses	Medium to High – technology is commonly used for sludge dewatering; presses have limited availability to lease; skilled technicians are required for maintenance and repairs during construction; a significant benefit is the technology typically achieves the greatest degree of dewatering and therefore most reduction in sediment volume, than other methods.	Medium	Retained (medium to high)

<b>Disposal</b>	On-site management	High – On-site management of sediment requires dewatering to a volume less than existing in-situ condition and closure of south lagoon by placing dewatered sediment from the north and middle lagoons in the south lagoon; expectation is an improved overall efficiency and shorter schedule duration compared to other sediment management options.	High	Retained (high)
	Beneficial reuse	High – once sediment is characterized and meets residential or industrial soil criteria, and potentially other testing depending on targeted reuse opportunities, a low-cost beneficial reuse option may become available; sediment must be dewatered sufficiently for transport and be amended to meet geotechnical suitability of the beneficial reuse option (insufficient data was available to select this as the preferred technology).	High	Retained (high)
	Landfill daily cover	Medium – requires that sediment is not contaminated with EPA priority pollutants and is dewatered and amended as necessary to achieve minimum requirements for geotechnical suitability, e.g., compressive strength, stackability, compactability, etc. (EA assumed these conditions are potentially viable for the Tyson sediment, though additional treatability testing would be needed to confirm).	High	Retained (medium to high)
	Landfill cell	Low – if not feasible for sediment to achieve landfill requirements for daily cover, this higher cost disposal is often necessary.	Low	Eliminated (low)

From the above table, the technologies were combined into the two remediation alternatives as appropriate that included more detailed conceptual cost estimating than the relative cost screening reflected in Table 5-2. These additional factors were incorporated into decision-making for developing two remediation alternatives:

- Beneficial reuse options may be available for the sediment, allowing for the low-cost management of the materials; however, the determination of applicability for Tyson sediment for beneficial reuse would follow physical and chemical characterization of sediment, as well detailed planning to identify and explore viable solutions for reuse;
- Permitting implications and public acceptance were considered equivalent among available approaches and not distinct enough to be a distinguishing factor for one remediation alternative over the other. In general, the cost estimate has considered the permitting effort required to obtain necessary approvals for construction as being relatively straight-forward;
- Dewatering techniques for sediment removed by hydraulic dredging is considered most suitable for this project accompanied by dewatering using geotubes or presses. Due to the uncertainty with availability of presses for leasing, qualified technicians for maintenance and repairs, and construction contractors in the region with press experience, this approach was not included within either remediation alternative. It is generally advisable to consider this approach further in subsequent studies in the event regional experience makes this technology cost-competitive with geotubes; and
- Physical properties of the sediment were not characterized at the time of this study, so EA assumed each remediation alternative is feasible and appropriate, though additional characterization and treatability studies are recommended to confirm technical feasibility; chemical properties data is available based on the NFRD finding by MDE through the voluntary cleanup process, so EA has assumed that limited waste profiling may be necessary for landfill disposal options and that all project permitting is administratively feasible and straight-forward.

Based on the screening evaluation and additional factors described above, the following alternatives were assembled from the retained technologies from Table 5-2:

- Alternative 1: Removal with On-site Management.
- Alternative 2: Removal with On-site Management and Off-site Disposal.

The following estimated volumes and areas of each lagoon were considered when developing the alternatives:

#### **North lagoon**

- Sediment volume: 14,383 cubic yards
- Total surface area: 464,398 square ft

### **Middle lagoon**

- Sediment volume: 66,173 cubic yards
- Total surface area: 478,984 square ft

### **South lagoon**

- Water volume: 49,447 cubic yards
- Total surface area: 184,036 square ft
- Total capacity: 78,200 cubic yards

#### **5.1.1 Alternative 1: Removal with On-site Management**

Alternative 1 integrates hydraulic dredging of the north and middle wastewater lagoons sediment, and placement inside an array of adjacent geotubes in the south wastewater lagoon. A soil cover would be placed over the small lagoon footprint for closure. Additionally, a thin layer of sand would be placed upon the north and middle lagoons following dredging to cover any residual sediment that was missed by the dredging or re-suspended into the water column during dredging.

A hydraulic dredge incorporates a rotating head or cutter located at the end of an intake pipe. The rotating head dislodges sediment, and combined with the turbulence and entrainment of water from a pump, creates a low-solids-content slurry mixture entering the intake. Figure 5-1 provides an example of a hydraulic dredge. The resulting sediment slurry is transported by pipeline to the large geotube bags. The tubes generally measure 10ft to 20ft in diameter, and can be in excess 100ft in length, and allow the excess water to drain through the textile mesh of the tube fabric as filtrate (Figure 5-2).

#### ***Mobilization and Demobilization***

Site mobilization and demobilization are standard items for construction contractor costs, and include deployment (and removal) of equipment and personnel, temporary facilities such as site trailers and utilities, and related activities.

#### ***Site Preparation and Access Development***

Access for construction equipment and support vehicles to lagoons, shorelines, and surrounding area immediately adjacent to the lagoons will be necessary. Limited site grading for access and construction of temporary access roads has been included per detailed assumptions in cost estimate notes. This also includes the preparation of a staging area where storage of construction materials and temporary facilities will occur, and is based upon a gravel surfaced space. Additionally, access will integrate an efficient route for trucks entering and exiting the main site entrance and traveling to the staging area. In addition to laydown area for products delivered to the Site and storage of equipment, a small unlined storage and dewatering area would be required for demolition debris encountered during dredging required removal and reuse/recycling or

disposal by the Town (demolition debris has been assumed to be a small fraction of the total project cost). Limited demolition has been included in the RI, consisting only of removal and staging of the metal framework present in the south lagoon, and removal and staging of the steel sheet pile wall. Based on aerial images of the Site's existing gravel lot, removal and relocation of several piles of miscellaneous materials on Town property will be necessary to create an approximately 2-acre area.

### ***Dewatering System Installation and Operation***

Alternative 1 includes the use of the south wastewater lagoon to contain the dredged sediment in geotubes. Prior to preparing the south lagoon and placing geotubes within the lagoon, the surface water will be withdrawn over a one to two-week period using a high capacity pump, which will discharge in the adjacent middle wastewater lagoon. This will result in a raise in water level in the north and middle lagoons by approximately 1.4ft. Once the geotubes are in place and dewatering sediment, a pump would withdraw filtrate water draining from the tubes at a sustained, but lower, pumping rate; similarly, this relatively clear filtrate water would be recycled into the middle lagoon. The design of this alternative will require a geotechnical evaluation to confirm the containment berm between the north and middle lagoons can accommodate the differential height of water this approach creates.

### ***South Wastewater Lagoon Preparation***

Based on the information from this study, it has been concluded that the south lagoon contains a negligible amount of soft sediment, which is preferable for Alternative 1. However, since subsurface soil lithology below the lagoon and the associated engineering properties such as shear strength and compressibility are unknown, the approach has included the placement of 2ft of gravel and a high-strength geotextile for soil reinforcement and separation from potentially soft and low-strength subgrade conditions. The gravel also provides a drainage layer below geotubes intended to limit erosion below the tube during the dewatering process. The base of the lagoon will include a sump at lowest elevation for pumping the filtrate to the adjacent lagoon during sediment dewatering. Pending additional subsurface information, limited equipment has been assumed to have access directly to the lagoon for this alternative. Small, low ground pressure equipment may be appropriate if further investigation reveals unstable conditions. Once the gravel layer is placed, the first layer of geotubes will be placed along with an interconnected pipe network, including the main dredge pipeline. Geotubes include a pipe manifold system, which is a series of separate pipes, one for each tube, connected to the main pipe with shut-off valves to control flow rate into the respective tube. During filling, either the effluent slurry from the dredge will be directed to all tubes uniformly, or selected individual tubes as needed for efficient filling. Once the tubes are filled to approximately 75 percent of total capacity, the second layer of tubes will be placed and connected to the manifold system. A port for polymer injection will also be placed in-line within the piping system between the dredge pipeline and manifold system. Polymers are used to promote agglomeration of individual fine-grained solid particles and colloids through two processes called flocculation and coagulation, which considerably enhances dewatering performance for most sediment types.

### ***Hydraulic Dredging of the North and Middle Wastewater Lagoons***

A hydraulic dredge vessel would be used to pump the sediment slurry from the north and middle lagoons to the geotubes. Even smaller sized hydraulic dredges that could be utilized for the project will generate a high rate of slurry flow during dredging, which is compatible with a geotubes operation for dewatering. A side effect from dredging by any methodology is that sediment is re-suspended into the water column, therefore it is anticipated that the water will become very turbid during the dredging project from both the act of dredging and the turbulence from effluent discharge that is recycling filtrate from geotubes. Colloidal-sized particles will remain in suspension in the north and middle lagoons for an extended period of time following dredging, likely after the contractor's demobilization, so a limited mass of sediment will eventually settle to the base of the lagoons. The recycling of clear filtrate water drained from the geotubes back into the north and middle lagoons will not significantly benefit the turbidity condition created by dredging (the filtrate water is typically clear).

### ***Dredged Material Processing***

The cost estimate provided in Appendix A includes the contractor's setup and operation of geotubes, manifold system, and polymer injection unit. Operation and maintenance is required during the filling of geotubes, not only to control the flow of dredged sediment slurry into the tubes, but also activities to aid in the tube dewatering process. Additionally, specialized technicians will monitor the flow rate and solids content of the slurry to adjust the polymer feed rate as necessary.

### ***On-site Management***

The cost estimate has assumed a 2-ft layer of soil cover placed above the geotubes. Some miscellaneous filling will be necessary to eliminate voids below and around tubes prior to placing the final soil cover. For this preliminary and conceptual planning evaluation, the early analysis suggests approximately 2ft of mounding above the existing adjacent grade is assumed. However, it is important to note that if the dewatering performance is as expected given experience with sediment, there may be no mounding in the south lagoon area following dewatering construction and long-term settlement. For design of Alternative 1, additional evaluation of volume change during dewatering is needed to better estimate the final grade of the two layers of geotubes after dewatering. This information will be generated by treatability studies and other pre-design investigation as described below. Since of closure of the south lagoon in this manner will experience settlement due to volume change in the geotubes, which includes both short-term during construction volume change and long-term settlement following construction, it is recommended that the Town's plans for this area avoid structures or site features that may incur damage or significant maintenance cost due to settlement.

### ***Residual Solids Cover Placement***

All dredging methods have a similar challenge with achieving maximum effectiveness due to sediment re-suspension during active dredging, and therefore residual solids should be expected in the lagoons immediately following dredging. One factor influencing re-suspension is sediment consistency, which for the middle lagoon, sampling and bathymetric survey interpreted sediment may behave closer to a dense fluid than a solid granular material; therefore, this layer will be easily disturbed and redistributed into the water column to some degree during dredging. Additionally, a higher organic content may contribute to colloidal-sized particles tending to remain in suspension in the water column for an extended timeframe when compared to mineralogical colloidal-sized particles that also tend to remain in suspension for a significant time (as observable turbidity). Although the bathymetric survey will improve a dredging design and limit areas that will be missed by the dredge, there will be areas of irregular bathymetry or variability sediment thickness above sand that is not removed by dredging. This factor, combined with the re-deposition of re-suspended sediment will be expected to result in residual sediment for the post-dredged condition of the north and middle lagoons. To address this effect to the extent practical, an imported sand will be placed as a thin layer has been included in the cost estimate for addressing residual sediment.

### ***Material Placement and Reshaping of Lagoons***

Some earthwork has been included in the cost estimate to account for site restoration to repair berm slopes and areas of construction access roads. Aggregate from access roads is assumed to be removed and placed in areas of the Site that would benefit from reshaping with slight grading changes to reduce steepness of slopes or to provide more uniform grades around the lagoons.

### ***Site Restoration***

Site restoration includes revegetation of areas within limits of the disturbance of construction, primarily for erosion control on slopes and for compliance with sediment erosion control plans. Revegetation with trees and shrubs has not been included in the cost estimate.

### ***Pre-design Studies and Additional Project Costs***

Additional costs are identified for Alternative 1 in Table 1 of the Cost Estimate Analysis provided in Appendix A and are briefly explained below:

- Treatability studies would be necessary to select the polymer that is most successful in agglomerating the site sediment, which dramatically increases the dewatering performance for most fine-grained sediment and lagoon sludge materials. Due to removing all surface water from the south lagoon for Alternative 1, up to six geotechnical borings distributed among the lagoon bed and containment berm between the north and middle lagoons would be performed to inform berm slope stability considerations. The data collection activities would include sampling for laboratory testing of shear strength

and consolidation for these important engineering properties, as well as basic physical properties testing (gradation, plasticity behavior of fine-grained fraction, specific gravity of solids, moisture content, organic matter content, and bulk density). This sampling and analysis also includes physical properties of sediment in the north and middle lagoons to support dredging design and geotube dewatering design.

- Engineering and permitting are included as percentages of total capital cost to cover the design development of construction drawings and specifications. Permitting has been assumed to be a relatively straightforward process, consisting of standard permits obtained by the construction contractor from the Town.
- Construction management and administration includes bid period and construction phase support to the Town to prepare the design for solicitation of construction bids, then to assist the Town to prequalify and review construction bids for an assumed best value selection during the bidding period. This line item also includes on-site field observation of construction activities during implementation, and office engineering support, to verify the contractor's compliance with permits and performance according to project drawings and specifications.
- A contingency of 15 percent is included in the cost estimate. The contingency is necessary to account for significant uncertainties that exist at this very early stage of planning prior to the completion of the remedial design. As the remedial design is developed, the contingency percentage may be reduced in amount as unknowns are addressed.

### **5.1.2 Alternative 2: Removal with On-site Management and Off-site Disposal**

Alternative 2 integrates hydraulic dredging of the north and middle wastewater lagoons sediment. This alternative includes the same approach to implementation regarding removal and dewatering technologies, as illustrated in Figures 5-2 and 5-3. In contrast to Alternative 1, the south wastewater lagoon would not be used for containing dewatered, dredged sediment. The large lot adjacent to the lagoons would be used to construct a lined dewatering area, and geotubes would be staged in this area for dewatering. Once dewatering has occurred to a sufficient degree, the geotubes would be opened and sediment inside excavated, loaded into trucks, and transported off-site to the nearest regional landfill for use as a daily cover material. No dredging has been assumed for the south lagoon, though a thin layer of sand will be placed in all lagoons as a residual solids cover.

The following text includes additional description of the approach for Alternative 2, organized by major activity similar to the cost estimate tables. Additional detail on specific assumptions of materials, quantities, and implementation are included in the "Basis of Budgetary Estimate" notes following the Alternative 2 cost estimate table (Table 2) provided in Appendix A.



### ***Site Mobilization and Demobilization***

The site mobilization and demobilization are equivalent to Alternative 1, expressed as an assumed percentage of capital cost.

### ***Site Preparation and Access Development***

This is equivalent to Alternative 1.

### ***Dewatering System Installation and Operation***

As with Alternative 1, this includes operation of a pump that will withdraw filtrate water draining from the geotubes at a sustained pumping rate and recycling the filtrate water into the middle lagoon. This item for Alternative 2 does not include water withdrawal to dewater the south lagoon, since the geotubes are not located in the south lagoon.

### ***Dewatering and Sediment Processing Pad Construction***

For Alternative 2, this approach requires that a 4.2-acre area of the gravel lot be converted to a large dewatering facility for geotubes. This primarily includes an impermeable geo-membrane overlain with free-draining gravel. Gravel will be rounded or sub-rounded to avoid damage to the geo-membrane or geotube fabric. The gravel layer provides a stable base for the geotubes, allowing drainage to a sump for collection and pumping of filtrate water to the middle lagoon. Some sub-grade preparation would occur prior to placing the geo-membrane, and it is generally expected that the 12in-thick gravel layer assumed in the cost estimate would be some combination of thickness of gravel above and below the geo-membrane to reduce the risk of construction-induced damage. The purpose of the geo-membrane is for efficient management of filtrate water from the tubes, and to avoid potential side effects from water infiltration directly to the subsurface in the contractor's work area, such as destabilizing sub-grade allowing rutting, erosion, and mucking of the area ground.

### ***Hydraulic Dredging of the North and Middle Wastewater Lagoons***

This approach is equivalent to that of Alternative 1.

### ***Dredged Material Processing***

This approach is equivalent to that of Alternative 1, except the geotubes are located adjacent to the lagoons on the existing gravel lot area.

### ***Off-site Disposal of Processed Dredged Material***

This approach includes final dewatering, amending the sediment to meet landfill requirements for geotechnical suitability (as needed), and disposing of sediment at a landfill as cover material. Disposal as daily cover in a landfill facility is typically lower cost than placement of sediment in

a landfill cell. Additionally, as previously discussed, use of the sediment in a lower cost beneficial reuse scenario that does not include landfill disposal may also be feasible following further investigation. The approach for processing and disposal of dewatered sediment within geotubes is that once the sediment has achieved sufficient dewatering to no longer contain free water that liberates from sediment during handling and loading in trucks, the geotubes would be torn open and sediment either amended with a drying agent or cement to improve geotechnical suitability for placement and compaction, or directly loaded for transport to off-site disposal. Waste characterization sampling and analysis would be required to meet the landfill's permit requirement for accepting materials as daily cover.

### ***Residual Solids Cover Placement***

The assumptions are equivalent to Alternative 1, with the exception that the south lagoon is included.

### ***Restoration Earthwork***

This includes similar site restoration activities as Alternative 1, with the exception that the south lagoon will not be utilized as a disposal facility, therefore, no soil cover has been included.

### ***Site Restoration***

The assumptions are equivalent to Alternative 1, with the exception that a larger area of restoration is required with the removal of the dewatering area, replacing the generally gravel-sized aggregate as fill in a larger area surrounding lagoons.

### ***Pre-design Studies and Additional Project Costs***

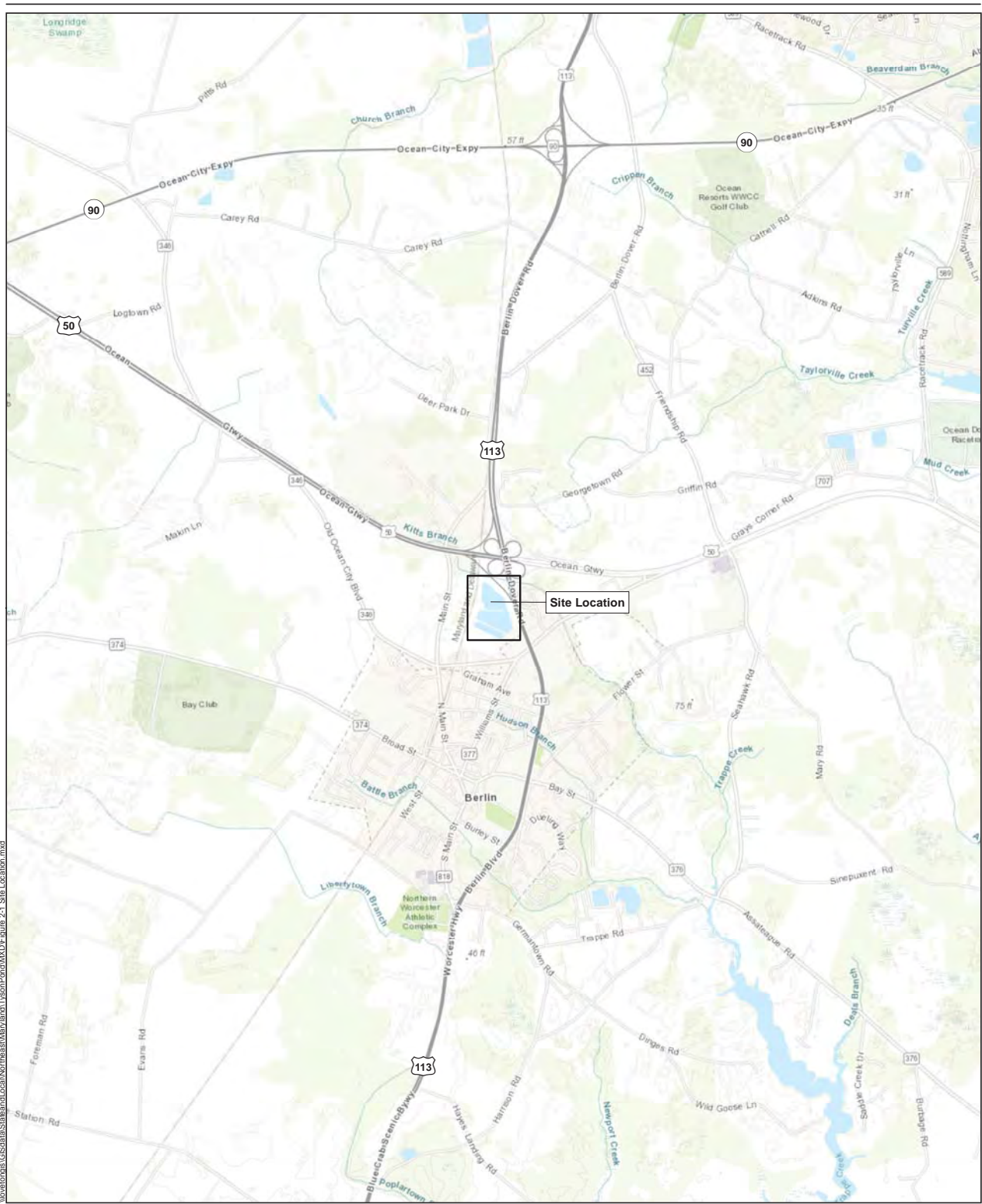
Additional costs unique to Alternative 2 are briefly explained below:

- In design, treatability studies will include additional testing of engineering properties using amendments such as cement to determine both dewatering rates for geotubes and geotechnical testing to meet suitability expectations that a daily cover material would require.

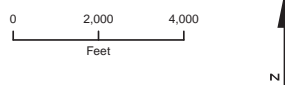
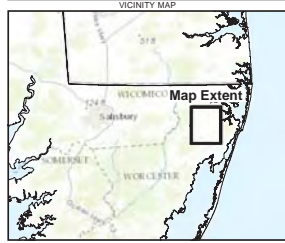
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- MDE. 2016. Letter regarding VCP No Further Requirements Determination. 09 May.
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- United States Department of Agriculture, Natural Resource Conservation Service. 2015. Web Soil Survey of Worcester County, Maryland. (<http://websoilsurvey.nrcs.usda.gov/app/>).

## Figures



\\novatos\GISData\StateandLocal\NorthwestMaryland\TysonLagoon\MXD\Figure 2-1 Site Location.mxd



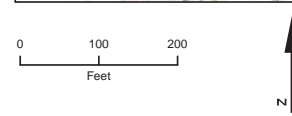
**Figure 2-1**  
**Site Location**  
 Tyson Lagoon  
 Berlin, Maryland

Map Date: 6/21/2017  
 Source: ESRI, 2017  
 Projection: NAD 1983 State Plane  
 Maryland Foot US





I:\projects\GIS\State\Local\Northwest\Map\Northwest\Tyson\Figure 3-1 Former Waste Lagoons.mxd



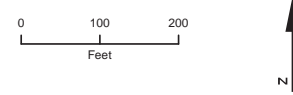
**Figure 3-1**  
**Former Waste Lagoons**  
 Tyson Lagoon  
 Berlin, Maryland

Map Date: 6/23/2017  
 Source: Google Earth, 2013  
 Projection: NAD 1983 State Plane  
 Maryland Foot US





Locations: G:\State\StateandLocal\Northwest\Map\Berlin\Tyson\Probe\MD\Figure\_3-2\_Sediment\_Probe\_Loc.mxd



- Legend**
- Sediment Probe
  - Sediment Probe - Did Not Meet Refusal

**Figure 3-2**  
**Sediment Probe Locations**  
 Tyson Lagoon  
 Berlin, Maryland

Map Date: 6/21/2017  
 Source: Google Earth, 2013  
 Projection: NAD 1983 State Plane  
 Maryland Foot US



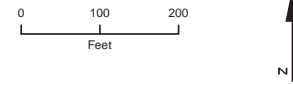


**Figure 3-3 Sediment Probe Setup**





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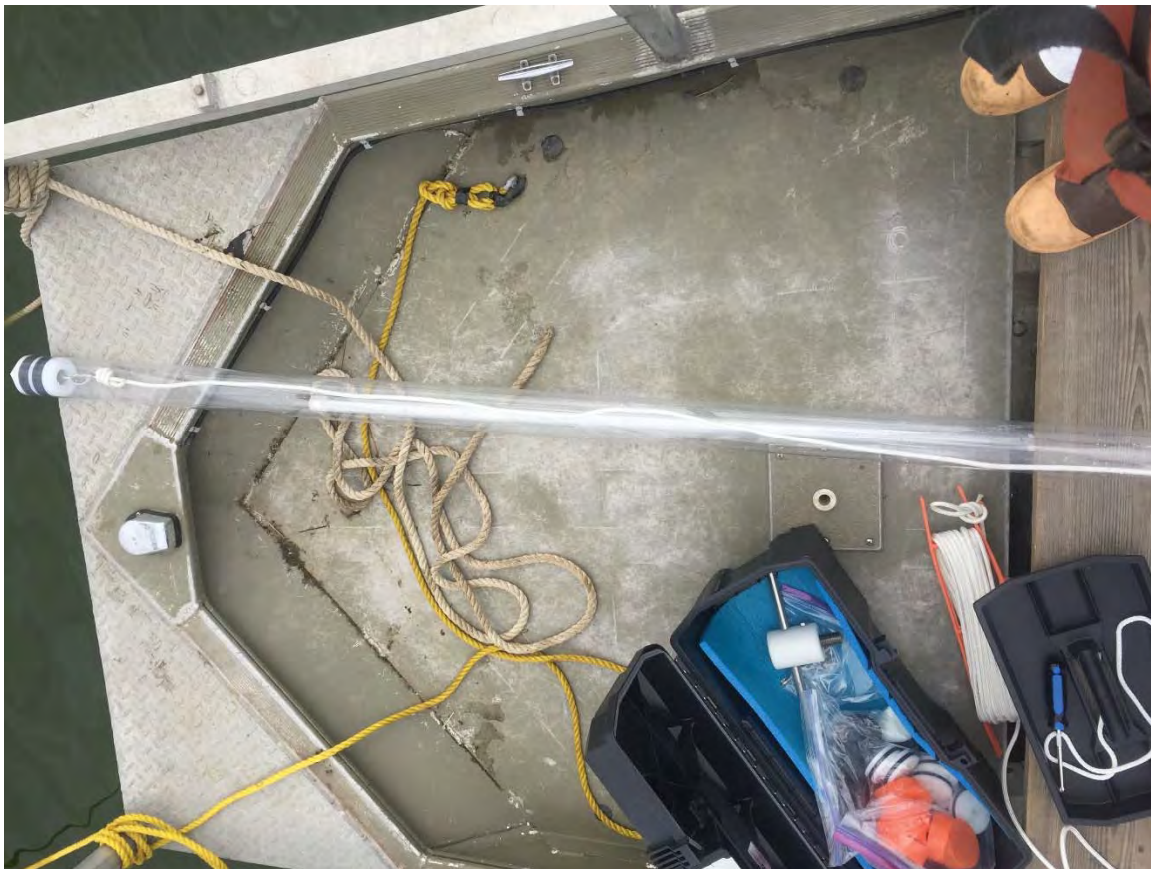


**Legend**  
 ■ Sediment Core

**Figure 3-4**  
**Sediment Core Locations**  
 Tyson Lagoon  
 Berlin, Maryland

Map Date: 6/21/2017  
 Source: Google Earth, 2013  
 Projection: NAD 1983 State Plane  
 Maryland Foot US





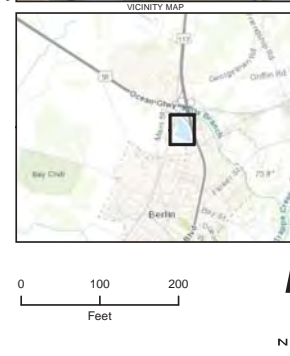
**Figure 3-5 Piston Corer Setup**






































**Figure 3-6 M/V *Shocker***



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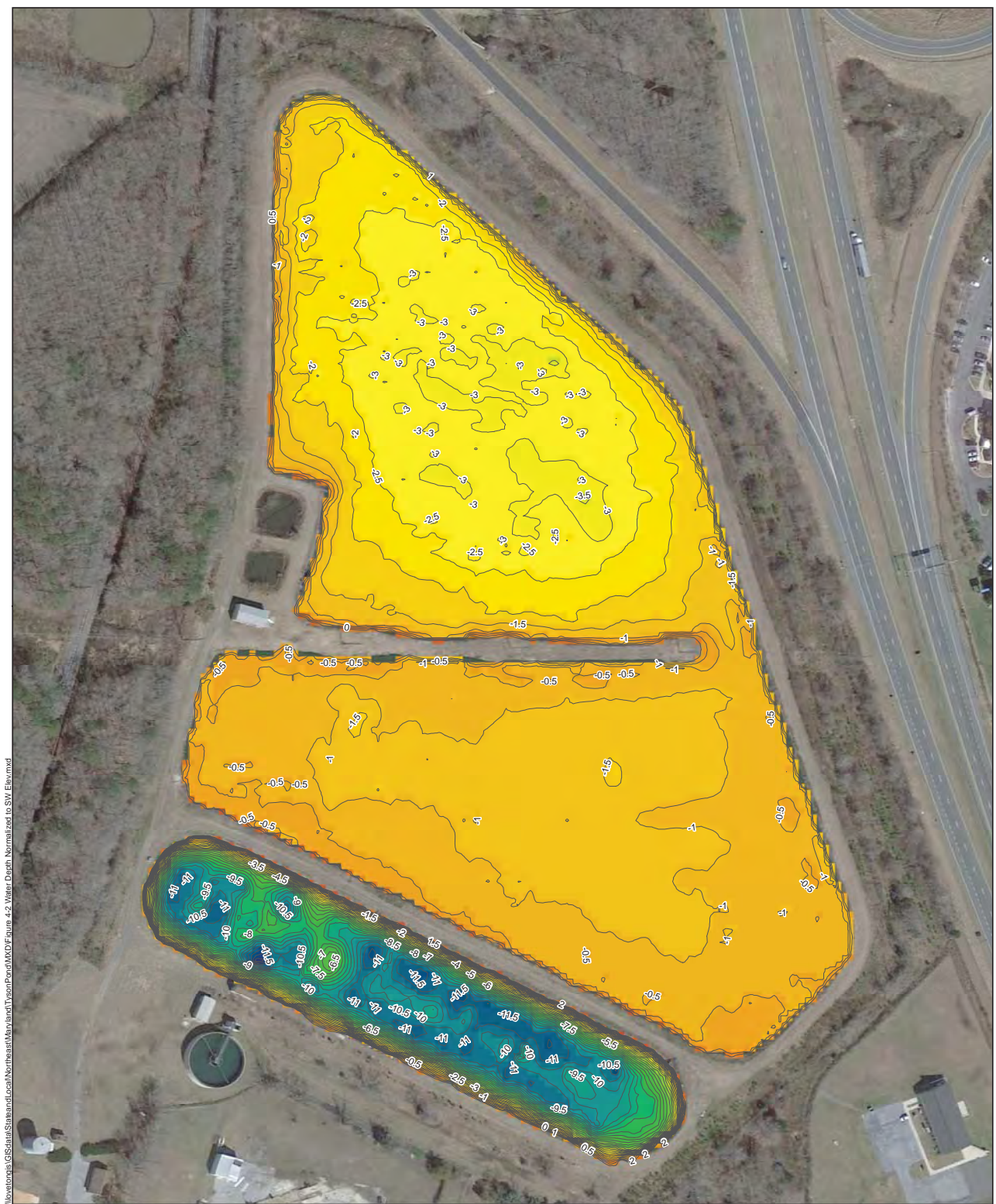
**Legend**

	Elevation Contour (0.5 foot interval)		22.1 - 22.5		27.1 - 27.5		32.1 - 32.5
	18.7 - 19		22.6 - 23		27.6 - 28		32.6 - 33
	19.1 - 19.5		23.1 - 23.5		28.1 - 28.5		33.1 - 33.5
	19.6 - 20		23.6 - 24		28.6 - 29		33.6 - 34
	20.1 - 20.5		24.1 - 24.5		29.1 - 29.5		34.1 - 34.5
	20.6 - 21		24.6 - 25		29.6 - 30		34.6 - 35
	21.1 - 21.5		25.1 - 25.5		30.1 - 30.5		35.1 - 35.5
	21.6 - 22		25.6 - 26		30.6 - 31		35.6 - 36
			26.1 - 26.5		31.1 - 31.5		36.1 - 36.5
			26.6 - 27		31.6 - 32		36.6 - 37

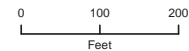
**Figure 4-1**  
**Digital Elevation Model –**  
**High Frequency (200 kHz)**  
 Tyson Lagoon  
 Berlin, Maryland

Map Date: 6/21/2017  
 Source: Google Earth, 2013  
 Projection: NAD 1983 State Plane  
 Maryland Foot US





I:\projects\GIS\StateStandLocal\NorthEastMap\Map\TysonLagoon\MD\Figure 4-2 Water Depth Normalized to SW Elevation



**Legend**

	Elevation Contour (0.5 foot interval)		

Note:  
 The measured surface water elevation for the North and Middle ponds was 26.31 ft.  
 The measured surface water elevation for the South pond was 31.5 ft.

**Figure 4-2**  
**Water Depth Normalized to**  
**Surface Water Elevation**  
 Tyson Lagoon  
 Berlin, Maryland

Map Date: 6/21/2017  
 Source: Google Earth, 2013  
 Projection: NAD 1983 State Plane  
 Maryland Foot US





I:\locations\GIS\State\StandLocal\Northwest\Map\Northwest\Tyson\DEM\Figure 4-3 Digital Elevation Model - Low Frequency 24kHz.mxd



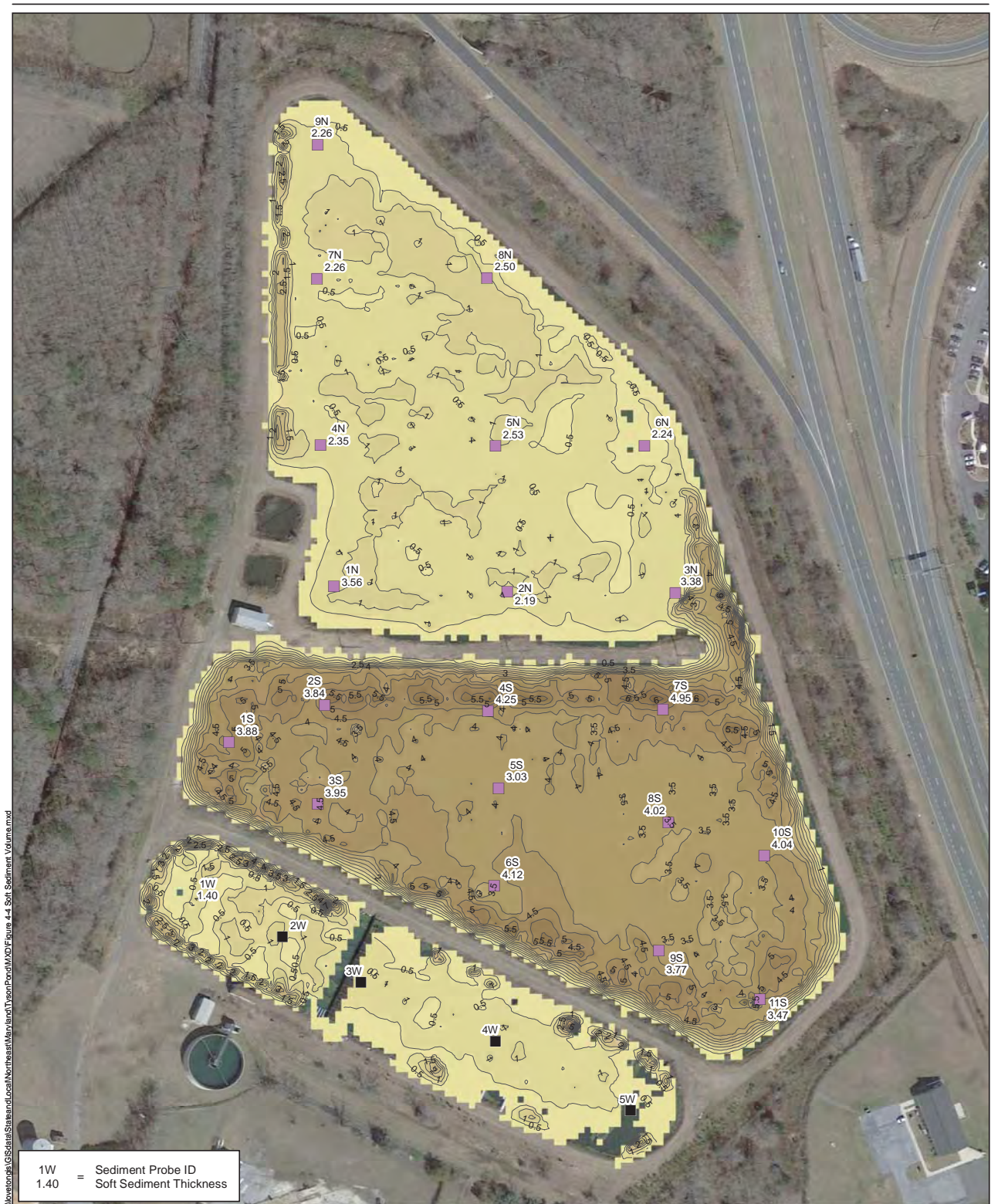
**Legend**

	Sediment Probe		20.1 - 20.5		25.1 - 25.5		30.1 - 30.5
	Sediment Probe - Did Not Meet Refusal		20.6 - 21		25.6 - 26		30.6 - 31
	Elevation Contour (0.5 foot interval)		21.1 - 21.5		26.1 - 26.5		31.1 - 31.5
<b>Elevation (NAVD88 US Feet)</b>			21.6 - 22		26.6 - 27		31.6 - 32
	17.6 - 18		22.1 - 22.5		27.1 - 27.5		32.1 - 32.5
	18.1 - 18.5		22.6 - 23		27.6 - 28		32.6 - 33
	18.6 - 19		23.1 - 23.5		28.1 - 28.5		33.1 - 33.5
	19.1 - 19.5		23.6 - 24		28.6 - 29		33.6 - 34
	19.6 - 20		24.1 - 24.5		29.1 - 29.5		34.1 - 34.5
			24.6 - 25		29.6 - 30		34.6 - 35

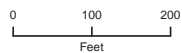
Figure 4-3  
 Digital Elevation Model -  
 Low Frequency (24 kHz)  
 Tyson Lagoon  
 Berlin, Maryland

Map Date: 6/22/2017  
 Source: Google Earth, 2013  
 Projection: NAD 1983 State Plane  
 Maryland Foot US





\\novations\GIS\State\State\Local\Northwest\MapArea\Tyson\Prd\Map\Figure 4-4 Soft Sediment Volume.mxd



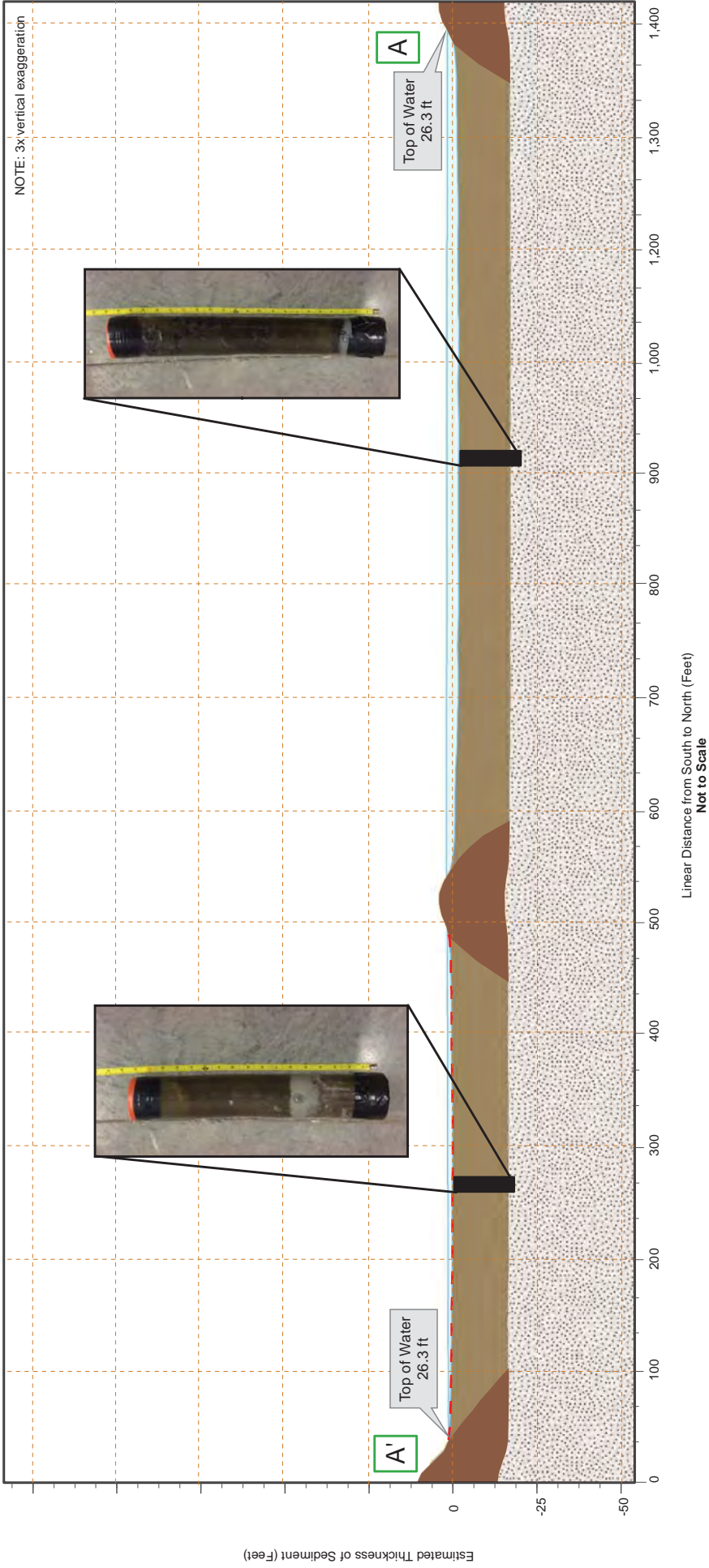
**Legend**

- Sediment Probe
- Sediment Probe - Did Not Meet Refusal
- Sediment Depth Contour (0.5 foot interval)
- In-Water Sediment Depth**
- 0
- 0.1 - 0.5
- 0.6 - 1
- 1.1 - 1.5
- 1.6 - 2
- 2.1 - 2.5
- 2.6 - 3
- 3.1 - 3.5
- 3.6 - 4
- 4.1 - 4.5
- 4.6 - 5
- 5.1 - 5.5
- 5.6 - 6
- 6.1 - 6.5
- 6.6 - 7
- 7.1 - 7.5
- 7.6 - 8
- 8.1 - 8.5
- 8.6 - 9

**Figure 4-4**  
**Soft Sediment Volume**  
Tyson Lagoon  
Berlin, Maryland

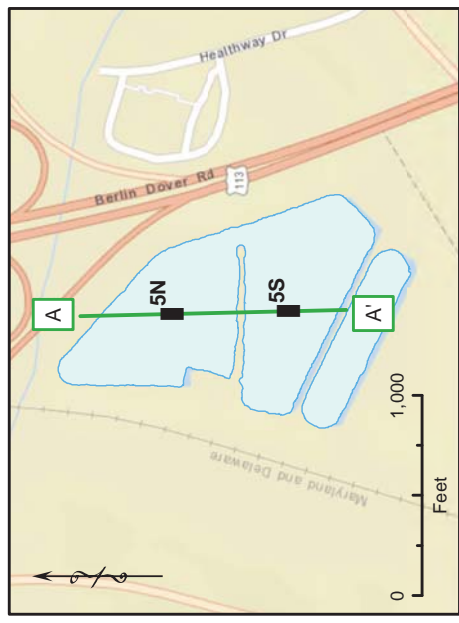
Map Date: 6/21/2017  
Source: Google Earth, 2013  
Projection: NAD 1983 State Plane  
Maryland Foot US



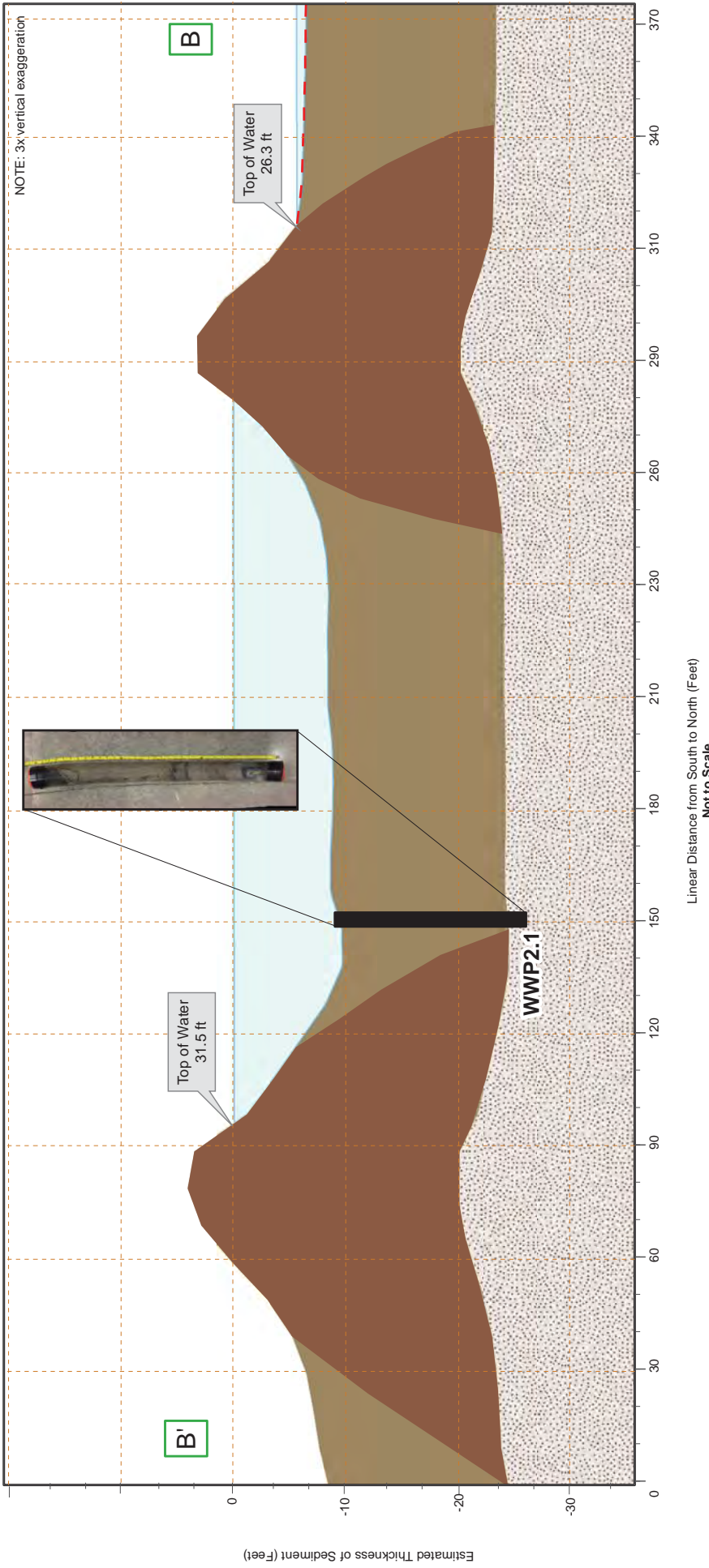


**Figure 4-5**  
Cross-section of North and Middle Lagoons

- Legend**
- Cross Section Line
  - - - Nepheloid Sediment Zone
  - Water
  - Soft Sediment
  - Firm Subgrade
  - Berm
  - Sediment Core Sample

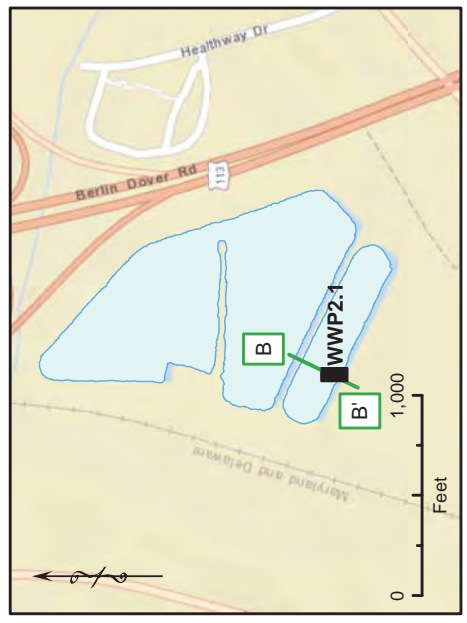






**Figure 4-6**  
Cross-section of South Lagoon

- Legend**
- Cross Section Line
  - - - Nepheloid Sediment Zone
  - Water
  - Soft Sediment
  - Firm Subgrade
  - Berm
  - Sediment Core Sample





**Figure 5-1 Standard Hydraulic Dredge (<http://www.dredge.com>)**



**Figure 5-2 Dewatering Using Geotubes (<http://www.gowatersolve.com/geotube>)**

# Tables

**TABLE 4-1. SEDIMENT PROBE RESULTS. BERLIN, MD. (MARCH 2017)**

Wastewater Lagoon	Sediment Probe Location	Coordinates (MD State Plane)		Water Depth (ft)	Probe Met Refusal?	Depth to Firm Subgrade (ft)	Thickness of Soft Sediment Layer (ft)
		Northing	Eastings				
South lagoon	1W	249223.599	1823853.226	9.87	YES	11.27	1.40
		249223.477	1823853.111				
	2W	249165.476	1823997.426	8.07	NO	~11.50	>3.43
		249165.525	1823997.539				
	3W*	249090.11	1824126.921	10.07	NO	~11.32	>1.25
		249090.678	1824126.341				
	4W	248993.29	1824348.322	9.91	NO	~11.58	>1.67
		248993.329	1824348.042				
	5W	248879.323	1824570.924	9.23	NO	~11.15	>1.92
		248879.3	1824570.523				
	1S	249486.01	1823909.323	1.03	YES	4.91	3.88
		249485.88	1823909.165				
2S	249547.359	1824066.986	1.36	YES	5.20	3.84	
	249547.346	1824066.996					
3S	249384.112	1824055.384	1.03	YES	4.97	3.95	
	249384.034	1824055.227					
4S	249537.053	1824335.746	1.37	YES	5.61	4.25	
	249537.383	1824335.575					
5S	249537.053	1824335.746	1.70	YES	4.73	3.03	
	249537.383	1824335.575					

\*Note: 3W location shifted slight to west of target coordinated due to silt curtains/tarp material on bottom at target location

Former Tyson Foods Facility  
Berlin, Maryland

Remedial Investigation of Former Waste Lagoons

**TABLE 4-1. SEDIMENT PROBE RESULTS. BERLIN, MD. (MARCH 2017)**

Wastewater Lagoon	Sediment Probe Location	Coordinates (MD State Plane)		Water Depth (ft)	Probe Met Refusal?	Depth to Firm Subgrade (ft)	Thickness of Soft Sediment Layer (ft)
		Northing	Eastng				
Middle lagoon	6S	249249.071	1824345.973	1.37	YES	5.49	4.12
		249248.821	1824345.665				
	7S	249539.857	1824623.697	1.36	YES	6.31	4.95
		249539.856	1824623.729				
	8S	249354.237	1824632.517	1.37	YES	5.38	4.02
		249354.279	1824632.436				
	9S	249143.141	1824616.894	1.37	YES	5.14	3.77
		249143.04	1824616.516				
	10S	249299.05	1824790.204	1.04	YES	5.08	4.04
		249299.042	1824790.01				
	11S	249063.164	1824783.463	1.04	YES	4.51	3.47
		249063.225	1824783.405				
1N	249486.01	1823909.323	1.49	YES	5.05	3.56	
	249485.88	1823909.165					
2N	249547.359	1824066.986	2.15	YES	4.34	2.19	
	249547.346	1824066.996					
3N	249384.112	1824055.384	1.49	YES	4.87	3.38	
	249384.034	1824055.227					
4N	249537.053	1824335.746	1.51	YES	3.86	2.35	
	249537.383	1824335.575					
North lagoon							

**TABLE 4-1. SEDIMENT PROBE RESULTS. BERLIN, MD. (MARCH 2017)**

Wastewater Lagoon	Sediment Probe Location	Coordinates (MD State Plane)		Water Depth (ft)	Probe Met Refusal?	Depth to Firm Subgrade (ft)	Thickness of Soft Sediment Layer (ft)
		Northing	Eastings				
North lagoon	5N	249410.22	1824353.262	2.50	YES	5.02	2.53
		249410.153	1824353.282				
	6N	249249.071	1824345.973	1.82	YES	4.06	2.24
		249248.821	1824345.665				
	7N	249539.857	1824623.697	1.82	YES	4.08	2.26
		249539.856	1824623.729				
	8N	249354.237	1824632.517	2.48	YES	4.98	2.50
		249354.279	1824632.436				
	9N	249143.141	1824616.894	1.80	YES	4.06	2.26
		249143.04	1824616.516				

**TABLE 4-2. SEDIMENT CORE RECOVERY. BERLIN, MD. (MARCH 2017)**

Wastewater Lagoon	Sediment Core Location	Geographic Coordinates (MD State Plane)		Water Depth (ft)	Depth to Firm Subgrade (ft)	Thickness of Soft Sediment Layer (ft)	Total Recovery (ft)	Notes
		Northing	Easting					
South lagoon	WWP1	249278.685	1823934.329	6.56	7.60	1.04	2.79	0-0.37ft: Brown sand. 0.37ft-1.25ft: Black sandy silt. 1.25ft-1.35ft: Black silty sand material. 1.35ft- 1.5ft: Grey/black sandy material. 1.5ft-2.79ft: Black silty sand material.
								0-0.31ft: Brown sand. 0.31ft- 0.6ft: Grey/black sandy material. 0.6ft-1.4ft: Black silty sand. 1.4ft-1.65ft: Grey/black sandy material. 1.65ft- 2.48ft: Black silty sand material. Dr. Jennifer Nyland takes core for independent analysis
	WWP2	249072.136	1824011.484	5.75	6.03	0.28	3.02	0-0.6ft: Black/grey silty sand material. 0.6ft- 1.27ft: White/grey silty sand material. 1.27ft-1.57ft: Dark brown sand. 1.57ft-3.02ft: White/grey silty sand material. Air pockets from escaping gases present



TABLE 4-2. SEDIMENT CORE RECOVERY. BERLIN, MD. (MARCH 2017)

Wastewater Lagoon	Sediment Core Location	Coordinates MD State Plane)		Water Depth (ft)	Depth to Firm Subgrade (ft)	Thickness of Soft Sediment Layer (ft)	Total Recovery (ft)	Notes
		Northing	Easting					
South lagoon	WWP2.1	249072.136	1824011.484	5.75	6.03	0.28	3.02	0-0.93ft: Grey/brown, coarse-grained sandy material. 0.93ft-1.43ft: Grey/brown sandy material. 1.43ft- 1.68ft: Dark brown sandy material. 1.68ft- 3.02ft: Grey' white silty sand material. Air pockets from escaping gases present. Milky liquid at bottom 5in of sample
	WWP3	249067.874	1824307.061	10.35	11.15	0.80	0.19	0-0.19ft: Compacted white sand underlying fine, brown silt
	WWP4	249097.494	1824317.941	3.40	5.78	2.38	2.23	0-2.23ft: White/grey sand material. <1in organic material at top of core
Middle lagoon	2S	249546.637	1824087.074	1.37	5.21	3.84	1.83	0-1.42ft: Dark brown silt. 1.42ft-1.83ft: White sandy material. No odor/sheen
	5S	249395.136	1824355.024	1.70	4.74	3.03	1.75	0-1.42ft: Dark brown silt. 1.42ft-1.75ft: White sandy material with cloudy liquid. No odor/sheen
	8S	249351.384	1824627.673	1.36	5.38	4.02	2.46	0-2.1ft: Dark brown silt. 2.1ft-2.46ft: White sandy material with cloudy liquid. Slight odor
	9S	249147.78	1824632.785	1.37	5.14	3.77	2.54	0-2.54ft: Dark brown silt. Strong odor

**TABLE 4-2. SEDIMENT CORE RECOVERY. BERLIN, MD. (MARCH 2017)**

Wastewater Lagoon	Sediment Core Location	Coordinates (MD State Plane)		Water Depth (ft)	Depth to Firm Subgrade (ft)	Thickness of Soft Sediment Layer (ft)	Total Recovery (ft)	Notes
		Northing	Easting					
North lagoon	1N	249742.635	1824079.029	1.46	5.02	3.56	2.44	0-1.86ft: Dark brown silt. 1.86ft-2.44ft: White sandy material with cloudy liquid. No odor/sheen
	3N	249726.211	1824660.572	1.44	4.82	3.38	2.75	0-2.75ft: Dark brown silt. Strong odor. Woody debris present
	5N	249973.499	1824348.601	2.45	4.98	2.53	1.44	0-0.9ft: Dark brown silt. 0.9ft-1.1ft: White/grey sandy material. 1.1ft-1.44ft: Dark brown silt. No odor/sheen
	9N	250460.35	1824056.967	1.79	4.05	2.26	1.38	0-1.10ft: Dark brown silt. 1.10ft-1.22ft: White/grey material. 1.22ft-1.38ft: Dark brown silt. No odor/sheen

**TABLE 5-1. REMEDIAL INVESTIGATION FINDINGS SUMMARY**

Wastewater Lagoon	Total Area of Lagoon (sqft)	Water Depth (ft)		Estimated Volume of Water (cy)	Thickness of Soft Sediment Layer (ft)		Estimated Volume of Soft Sediment (cy)	Total Capacity of Lagoon (cy)	Description of Sediment Layers
		Min.	Max.		Min.	Max.			
South lagoon	184,036	0	11.0	49,447	<0.5	3.5	--	78,200	Thin layer of dark brown, silty sediment present in lagoon. Concentrated primarily along the lagoon margins. The underlying layer consists of a white/grey, coarse-grained material present throughout the lagoon.
Middle lagoon	478,984	0	1.5	--	1.0	6.0	66,173	--	Very thin layer of fine-grained sediment particles (nepheloid layer). Nepheloid layer is followed by a thick layer of dark brown, silty sediment. Greatest concentration of this layer is along the northwestern margin. This lagoon contains the greatest volume of soft sediment. The underlying layer consists of a white/grey, coarse-grained material present throughout the lagoon.
North lagoon	464,398	0	3.5	--	0	4.5	14,383	--	Layer of dark brown, silty sediment. Greatest concentrations of this layer are along the lagoon margins and southeastern extent where north and middle lagoons connect. The underlying layer consists of a white/grey, coarse-grained material present throughout the lagoon.

**Appendix A**

**Cost Estimate Analysis**

**City of Berlin  
Former Tyson Property Remediation  
Berlin, Maryland**

**TABLE 5-2: Alternative 1 - Remediation with On-Site Management and South Pond Filling  
Preliminary Engineering Cost Estimate**

Item No.	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
<b>Construction Cost</b>					
1	Mobilization/Demobilization	5%	%	n/a	\$ 257,270
2	Site Preparation and Access Development	1	LS	\$ 147,600	\$ 147,600
3	Dewatering System Installation and Operation	5	Month	\$ 13,800	\$ 69,000
4	South Pond Preparation	1	LS	\$ 497,200	\$ 497,200
5	Hydraulic Dredging of Lagoon	89,300	CYD	\$ 16	\$ 1,428,800
6	Dredge Material Processing	89,300	CYD	\$ 14	\$ 1,250,200
7	South Pond Filling (using geotubes)	1	LS	\$ 460,000	\$ 460,000
8	Residual Solids Cover Placement	21,800	CYD	\$ 30	\$ 654,000
9	Material Placement and Reshaping of Lagoon	19,000	CYD	\$ 6	\$ 114,000
10	Site Restoration	8	AC	\$ 3,000	\$ 24,600
<b>Subtotal Construction Cost</b>					<b>\$ 4,902,670</b>
<b>Treatability Studies and Pre-Design Investigations</b>					<b>\$ 300,000</b>
<b>Engineering and Permitting (10%)</b>					<b>\$ 490,267</b>
<b>Construction Management and Administration (8%)</b>					<b>\$ 392,214</b>
<b>Contingency (15%)</b>					<b>\$ 735,401</b>
<b>TOTAL ESTIMATED CONSTRUCTION COST</b>					<b>\$ 6,820,551</b>
<b>ROUNDED TO</b>					<b>\$ 6,821,000</b>

**Basis of Budgetary Estimate:**

- Mobilization/demobilization includes cost for deployment of equipment and personnel, contractor QC controls (e.g., survey, testing, etc.), security measures, and associated temporary facilities. Cost allowance of \$25,000 has been included for contractor planning, submittal preparation, and utility clearance. Mobilization/demobilization costs have been estimated as a percentage of the total cost (less transportation and disposal, where applicable). This estimate assumes no odor management system will be required.
- Site preparation and access development includes the development of access into the site to support construction activities as well as establishing staging areas for equipment and the management of dredge materials and clean imported materials. Temporary access roads (assumed 2,000 linear feet estimated at \$20/LF) have been assumed to be constructed of aggregate underlain by non-woven geotextiles. This cost estimate assumes the existing gravel areas are sufficient to construction equipment and material staging and no additional cost for this item has been included. Staging areas and access road materials will be incorporated into the final reshaping of the lagoons. Additionally this item includes modest temporary erosion and sedimentation controls as well as work zone controls (estimated at \$20,000). Costs for the preparation of the south lagoon (excluding dewatering) has been included and would likely consist of demolition of existing features consisting of metal framework floats and sheet pile wall and frame, modest regrading, and access development (estimated at \$75,000). It is assumed the gravel lot and surrounding area immediately to the south of the south lagoon is available for staging and project use.
- Dewatering System Installation and Operation includes the installation of pumps, piping, and temporary dewatering sumps for the dewatering of lagoon sediments to facilitate processing in the south lagoon. Assumed treated water volume for this activity will be approximately 10,000,000 gallons, based on calculations in GIS indicate that approximately 1,335,000 cubic feet of water would require transfer to the north and middle lagoons, raising the elevation of the north and middle lagoons by 1.4 feet. An additional 29,000,000 gallons would require collection and discharge to the ponds as a result of dewatering efforts. A geotechnical evaluation of pond geometry and berms may be necessary in the future to ensure this increased water elevation and south pond dewatering would not have a detrimental effect on existing separation berm global slope stability. A portion of this water (standing water in the south lagoon) will require dewatering prior to commencing sediment management operations. Assumes a 700 gallon per minute initial dewatering capability will be required for this activity and 300 gallons per minute discharge during sediment dewatering operations.
- South Pond Preparation consists of the dewatering (costs included above), mechanical dredging of any visible perimeter process solids material above sand (in the dry removal), demolition of existing features, removal of existing piping connections to the middle lagoon, regrading and shaping of the surface and development of access. It is assumed the pond bottom is water tight and can be dewatered. Field activities to date have indicated that sediment within this lagoon is minimal and primarily along the perimeter. This item includes the placement of high strength woven monofilament geotextile with 2 feet of 1-3" bank run gravel (or pumpable gradation of well-graded sand+gravel - approximately 21,800 tons of material) placed in ~6" lifts fully across pond per lift to reduce mudwaving risk.
- Hydraulic Dredging of Lagoon includes setup and operation of a floating hydraulic dredging operation with suction/cutterhead dredges. Dredged material will be conveyed via floating HDPE piping to the south lagoon where the sediment material will be dewatered and the filtrate water (some very limited turbidity after geotubes) will be returned to the lagoon. It is assumed the quantity of debris in the lagoons is minimal and the sediment characteristics are suitable for hydraulic dredging. Total volume of material assumed to be hydraulically dredged is 89,300 cyds based on sediment thicknesses observed in the field assessment and calculated in GIS. This quantity accounts for up to six inches of overdredging for 1/2 the pond bed in the in-situ volume, i.e., specification of +/- 6 inches for dredging design. Due to the incorporation of a residual cap and the likely remedial objectives for the project, it has been assumed dredging will be focused on mass removal of existing sediments and will not require extensive clean-up passes or post-removal testing. No post remediation of lagoon water has been assumed to be required and any residual sediments in the water column will be allowed to settle.

**City of Berlin**  
**Former Tyson Property Remediation**  
**Berlin, Maryland**

**TABLE 5-2: Alternative 1 - Remediation with On-Site Management and South Pond Filling**

- 6 Dredge material processing includes the setup and operation of a geotube operation for the processing and dewatering of dredged sediment. Processing assumptions include solids for the sediment is at 12%, dredge material will be pumped at 6%, and the material will be dewatered in GT500D geotubes with polymer addition at a rate of 10/lbs per dry ton. This cost includes a six-inch diameter manifold system for delivery of the dredged material to the geotubes. Cost for this element was developed with support from WaterSolve LLC of Caledonia, Michigan. Costs have been included for the supply and installation of a manifold system for the geotube system (\$40,000).
  - 7 South Pond Filling includes the placement of fill as soil cover and to fill void space within the southern-most lagoon needed to supplement the dredged material processed and remaining in geotubes. Calculations have been performed to determine the processed volume and weight of material. Assumes 2 feet of clean fill soil (20,000 cubic yards of total material - 25% top soil and 75% subsoil) will be imported and placed over the processed sediment material. Pond capacity is approximately 88,000 cy and dewatered sediment volume is less than this, however, two layers of geotextile tubes will rise above the adjacent ground surface until dewatered sufficiently for soil cover placement (this duration requires design calculations).
  - 8 Residual Solids Cover Placement includes the hydraulic placement of a six-inch thick residual cap comprised of imported sand material. Assumes material will be conveyed hydraulically without stringent standards for layer thickness. Sediment particles represented by turbidity in the water post-dredging may settle after placement of the residual solids cover, but material quantities have been assumed to be minimal.
  - 9 Material placement and reshaping of lagoons consists of the loading, hauling, and placement of the processed dredged material for expanding and contouring some sections of the lagoons. This item includes some miscellaneous restoration earthwork activities repair any areas of lagoon berm slopes above the water surface. It is assumed most of the berms around the existing middle and north lagoons would remain, but would be regraded to make them less steep. The volume of earthwork associated with this activity for the purpose of this estimate is approximately 19,000 cyds (15000 cys miscellaneous grading, 2,500 cyd berm reshaping, and 1,500 cyds in pad material).
  - 10 Site restoration includes reestablishing a vegetative cover over areas disturbed by remediation activities as well as the incorporation of staging area and access road aggregate materials in the south pond closure. Trees, shrubs, and recreation facilities have not been included in this estimate.
  - 11 Due to the voluntary nature of the activity, limited constituents of concern, and no planned discharge off-site of water generated during the project, permitting requirements for this project have been assumed to be modest, consisting primarily of general grading permits and a sediment and erosion control permit.
- A Preliminary Engineering Cost estimates are based on 2017 dollars.
- B Preliminary Engineering Cost Estimates based on past experience, analogous cost estimates, and approximate take-offs from the available information. Except for geotextile tubes, limited direct vendor or outside material estimates were obtained in the development of this estimate and the actual cost may differ.
- C Based on sediment type, sediment volume, sediment thickness, limited constituents of concern, and site access, the conceptual approach for this cost estimate consists of hydraulic dredging with geotube dewatering and on-site management and disposal of dewatered sediments. Based on further site investigation and conceptual studies additional options may and should be considered to ultimately find the alternative that best meets the Town of Berlin objectives for the project, complies with all appropriate rules and regulations, and is cost-effective.

**City of Berlin**  
**Former Tyson Property Remediation**  
**Berlin, Maryland**

**TABLE 5-3: Alternative 2 - Remediation with On-site Management and Off-Site Disposal**  
**Preliminary Engineering Cost Estimate**

Item No.	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
<b>Construction Cost</b>					
1	Mobilization/Demobilization	5%	%	n/a	\$ 229,900
2	Site Preparation and Access Development	1	LS	\$ 87,600	\$ 87,600
3	Dewatering System Installation and Operation	6	Month	\$ 13,800	\$ 82,800
4	Dewatering and Sediment Processing Pad Construction	1	LS	\$ 325,500	\$ 325,500
5	Hydraulic Dredging of Lagoon	89,300	CYD	\$ 16	\$ 1,428,800
6	Dredge Material Processing	89,300	CYD	\$ 14	\$ 1,250,200
7	Off-Site Disposal of Processed Dredge Material	47,747	Ton	\$ 15	\$ 716,205
8	Residual Solids Cover Placement	26,100	CYD	\$ 30	\$ 783,000
9	Material Placement and Reshaping of Lagoon	19,000	CYD	\$ 6	\$ 114,000
10	Site Restoration	9	AC	\$ 3,000	\$ 26,100
<b>Subtotal Construction Cost</b>					<b>\$ 5,044,105</b>
<b>Treatability Studies and Pre-Design Investigations</b>					<b>\$ 200,000</b>
<b>Engineering and Permitting (10%)</b>					<b>\$ 432,790</b>
<b>Construction Management and Administration (8%)</b>					<b>\$ 346,232</b>
<b>Contingency (15%)</b>					<b>\$ 756,616</b>
<b>TOTAL ESTIMATED CONSTRUCTION COST</b>					<b>\$ 6,779,743</b>
<b>ROUNDED TO</b>					<b>\$ 6,780,000</b>

**Basis of Budgetary Estimate:**

- Mobilization/demobilization includes cost for deployment of equipment and personnel, contractor QC controls (e.g., survey, testing, etc.), security measures, and associated temporary facilities. Cost allowance of \$25,000 has been included for contractor planning, submittal preparation, and utility clearance. Mobilization/demobilization costs have been estimated as a percentage of the total cost (less transportation and disposal, where applicable). This estimate assumes no odor management system will be required.
- Site preparation and access development includes the development of access into the site to support construction activities as well as establishing staging areas for equipment and the management of dredge materials and clean imported materials. Temporary access roads (assumed 2,000 linear feet estimated at \$20/LF) have been assumed to be constructed of aggregate underlain by non-woven geotextiles. This cost estimate assumes the existing gravel areas are sufficient to construction equipment and material staging and no additional cost for this item has been included. Access road materials will be incorporated into the final materials used for reshaping the lagoons. Additionally this item includes modest temporary erosion and sedimentation controls as well as work zone controls (estimated at \$20,000). It is assumed the gravel lot and surrounding area immediately to the south of the south lagoon is available for staging and project use. Includes an estimate of \$75,000 for the demolition of existing features in the south lagoon (consisting of metal framework, floats, and sheet pile wall).
- Dewatering System Installation and Operation includes the installation of pumps, piping, and temporary dewatering sumps for the dewatering operations for lagoon sediments. Approximately 32,000,000 gallons would require collection and discharge to the ponds as a result of dewatering efforts. Assumes a 300 gallons per minute for discharge during sediment dewatering operations
- Dewatering and Sediment Processing Pad Construction includes the construction of a 4.2 acre geomembrane and gravel cap for geotube operations in the flat area south of the south pond. Pad construction (\$1.75/sf) will include general grading and surface preparation, two-foot berm construction, installation of 4.2 acres of 186,000 square feet of geombrane, overlain with 10 oz. nonwoven geotextile, and covered with 12-inches of sand and gravel (6,900 cubic yards).
- Hydraulic Dredging of Lagoons includes setup and operation of a floating hydraulic dredging operation with suction/cutterhead dredges. Dredged material will be conveyed via floating HDPE piping to the dewatering pad where the sediment material will be dewatered and the filtrate water (some very limited turbidity after geotubes) will be returned to the lagoons. It is assumed the quantity of debris in the lagoons is minimal and the sediment characteristics are suitable for hydraulic dredging. Total volume of material assumed to be hydraulically dredged is 89,300 cyds based on sediment thicknesses observed in the field assessment and calculated in GIS. This quantity accounts for up to six inches of overdredging for 1/2 the pond bed in the in-situ volume, i.e., specification of +/- 6 inches for dredging design. Based on field results, no dredging for the south pond is assumed to be required. Due to the incorporation of a residual cap and the likely remedial objectives for the project, it has been assumed dredging will be focused on mass removal of existing sediments and will not require extensive clean-up passes or post-removal testing. No post remediation of lagoon water has been assumed to be required and any residual sediments in the water column will be allowed to settle.
- Dredge material processing includes the setup and operation of a geotube operation for the processing and dewatering of dredged sediment. Processing assumptions include solids for the sediment is at 12%, dredge material will be pumped at 6%, and the material will be dewatered in GT500D geotubes with polymer addition at a rate of 10/lbs per dry ton. This cost includes a six-inch diameter manifold system for delivery of the dredged material to the geotubes. Cost for this element was developed with support from WaterSolve LLC of Caledonia, Michigan. Costs have been included for the supply and installation of a manifold system for the geotube system (\$40,000). It is assumed processing will sufficiently dewater the sediment to allow the passing of a paint filter test to meet requirements for transportation of this material over public roads.
- Off-Site Disposal of Processed Dredge Material consists of the loading, transportation, and disposal of dredged sediments at an off-site commercial landfill. Calculations have been performed (accompanying spreadsheets) to determine the processed volume and weight of material. It is assumed the material is classified as non-hazardous and may be disposed of in a Subtitle D Commercial Landfill Facility (assumed for this estimate as Worcester County CLF). Assumed the Worcester County CLF would waive the tipping fee for the material as it would be used for cover material. The volume for disposal include staging area materials used for sediment processing and hauling. This disposal volume includes the addition of 6,900 cubic yards of material (assuming 1.6 tons/cyd density) required for construction of the dewatering and sediment processing pad.

*City of Berlin  
Former Tyson Property Remediation  
Berlin, Maryland*

**TABLE 5-3: Alternative 2 - Remediation with On-site Management and Off-Site Disposal**

- 8 Residual Solids Cover Placement includes the hydraulic placement of a six-inch thick residual cap comprised of imported sand material. Assumes material will be conveyed hydraulically without stringent standards for layer thickness. Sediment particles represented by turbidity in the water post-dredging may settle after placement of the residual solids cover, but material quantities have been assumed to be minimal.
- 9 Restoration Earthwork and Closure of South Pond includes the miscellaneous restoration earthwork activities to facilitate the final end use of the facility as well as the final earthwork activities necessary to remove operations associated with sediment processing in the south pond. The volume of earthwork associated with this activity for the purpose of this estimate is approximately 19,000 cyds (15,000 cyd miscellaneous grading, 2,500 cyd berm reshaping, and 1,500 cyds in pad material). It is assumed most of the berms around the existing lagoons would remain, but would be regraded to make them less steep
- 10 Site restoration includes reestablishing a vegetative cover over areas disturbed by remediation activities. Trees, shrubs, and recreation facilities have not been included in this estimate.
- 11 Due to the voluntary nature of the activity, limited constituents of concern, and no planned discharge off-site of water generated during the project, permitting requirements for this project have been assumed to be modest, consisting primarily of general grading permits and a sediment and erosion control permit.
  - A Preliminary Engineering Cost estimates are based on 2017 dollars.
  - B Preliminary Engineering Cost Estimates based on past experience, analogous cost estimates, and approximate take-offs from the available information. Except for geotextile tubes, limited direct vendor or outside material estimates were obtained in the development of this estimate and the actual cost may differ.
  - C Based on sediment type, sediment volume, sediment thickness, limited constituents of concern, and site access, the conceptual approach for this cost estimate consists of hydraulic dredging with geotube dewatering and off-site commercial disposal of dewatered sediments. Based on further site investigation and conceptual studies additional options may and should be considered to ultimately find the alternative that best meets the Town of Berlin objectives for the project, complies with all appropriate rules and regulations, and is cost-effective.



**Appendix B**

**Photograph Log**

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**Photographic Record**  
**Sample location: 1N**



**Sample location: 3N**



**Sample location: 5N**



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**Photographic Record**  
**Sample location: 9N**



**Sample location: 3S**



**Sample location: 5S**



---

**Photographic Record**  
**Sample location: 8S**



**Sample location: 9S**



**Sample location: WWP1**



---

**Photographic Record**  
**Sample location: WWP2**



**Sample location: WWP3**



**Sample location: WWP4**





EA Engineering, Science, and Technology, Inc., PBC

225 Schilling Circle, Suite 400  
Hunt Valley, MD 21031  
Telephone: 410-584-7000  
Fax: 410-771-1625  
[www.eaest.com](http://www.eaest.com)

August 4, 2017

Ms. Laura Allen Town  
Administrator Town of  
Berlin  
10 Williams Street  
Berlin, MD 21811

RE: Executive Summary  
Remedial Investigation and Cost Estimate Former  
Tyson Foods Facility  
9943 Old Ocean City Boulevard Berlin,  
Maryland

Dear Ms. Allen:

EA Engineering, Science, and Technology, Inc., PBC (EA) was contracted by the Town of Berlin to develop viable conceptual remediation approaches and conceptual level cost estimates to remove sediments that have accumulated within the waste lagoons of the former Tyson Foods Facility located at 9943 Old Ocean Town Boulevard (Site) located in Berlin, Maryland 21811.

The scope of work for this remedial investigation (RI) was developed based on a review of available historic documents and environmental reports for the Site, as well as review of site investigations performed by EA in previous phases of the project. To further support the remedial cost assessment, EA performed an additional site investigation in March 2017. While previous environmental assessment sampling and analysis efforts did not identify significant environmental exposure concerns associated with the existing sediments within the lagoons, EA understands the historical uses of the lagoons present challenges to their potential reuse. The Town of Berlin may want to consider addressing the sediments within the lagoons before repurposing the lagoons for public recreation.

EA's investigation determined the depth of water and sediment of the 3 lagoons. Results are shown below:

North lagoon – water depth ranges from 1.5ft-2.5ft and sediment thickness ranges from 0.5ft-4ft – total sediment volume estimated at approximately 14,383 cubic yards

Middle lagoon – water depth ranges from 1ft-1.7ft and sediment thickness ranges from 3.5ft- 5.5ft – total sediment volume estimated at approximately 66,173 cubic yards

South lagoon – water depth ranges from 8.1ft-10.1ft and sediment thickness ranges from 0-2ft – total volume was not calculated due to lack of sediment

Two remediation alternatives to address sediment in the former wastewater lagoons were developed. In general, the process of removing sediments from any water body requires three primary tasks that are evaluated by the following categories: (1) removal of sediment, (2) dewatering of sediment, and (3) disposal of sediment.



Alternative 1) Removal with On-site Management --- \$6,821,000

Alternative 1 integrates hydraulic dredging of the north and middle wastewater lagoons sediment, and placement inside an array of adjacent geotubes in the south wastewater lagoon.

Alternative 2) Removal with On-site Management and Off-site Disposal --- \$6,780,000

Alternative 2 integrates hydraulic dredging of the north and middle wastewater lagoons sediment, and placement inside an array of adjacent geotubes. In contrast to Alternative 1, the south wastewater lagoon would not be used for containing dewatered, dredged sediment. The large lot adjacent to the lagoons would be used to construct a lined dewatering area, and geotubes would be staged in this area for dewatering. Once dewatering has occurred to a sufficient degree, the geotubes would be opened and sediment inside excavated, loaded into trucks, and transported off-site to the nearest regional landfill for use as a daily cover material.

It should be noted that the current site uses related to the lagoons (including no water contact, passive use) can continue and would not require remedial action of the existing sediments. However, the Town of Berlin is considering renovating the site for recreational purposes and has requested consideration of the following options not presented in the report:

Option 1) Removal of sediments from the middle lagoon and On-site Management:

Option 1 involves hydraulic dredging of the middle wastewater lagoons sediment, and placement inside an array of adjacent geotubes in the south wastewater lagoon.

Estimated cost --- \$5,000,000

Option 2) Filling of south lagoon with off-site soil fill source

Option 2 involves site preparation, purchasing and placement of off-site soil sufficient to fill in the south lagoon.

Estimated cost --- \$2,500,000

EA greatly appreciates the opportunity to serve you on this project. If I can be of any further assistance, please do not hesitate to contact me at 410-329-5125.

Sincerely,

A handwritten signature in black ink that reads "James M. Hulbert".

James Hulbert  
Project Manager

BUILDING CONDITION ASSESSMENT  
BERLIN FALLS PARK  
BERLIN, MARYLAND

Prepared For:  
The Town of Berlin  
10 William Street  
Berlin, Maryland 21811

Prepared By:  
Davis, Bowen & Friedel, Inc.  
601 East Main Street, Suite 100  
Salisbury, Maryland 21804

DBF #0050A105.A01

June 16, 2017



## **EXECUTIVE SUMMARY**

On May 19, 2017, Davis, Bowen & Friedel, Inc. observed the condition of the Berlin Falls Park Building, formerly Tyson Foods Plant, located on Route 346 in Berlin, Maryland. The purpose of our observations and this report is to provide a general visual assessment of the condition of the building and to provide recommendations for repair and replacement. Observations included, where accessible, the roofing, roof framing, floor framing, masonry walls, floor slabs and foundation walls. Refer to the attached Photos 1 through 8 and the Google Earth image for general exterior views of the building.

The gross floor area of the facility is over 65,000 square feet. The original building is over 40 years old. The majority of the superstructure of the building is comprised of precast concrete tees, beams, columns and hollow core slabs. The precast concrete components are in fair to good condition. The remaining components are structural steel beams, columns, open web joists and steel decking. Structural steel components subject to high humidity in an unconditioned space have deteriorated significantly. The structural steel components vary from poor to fair condition with some areas of local failure. The majority of the facility is one level with relatively high roofs. A second level exists in two areas: one supported on precast concrete plank and the other on timber floor joists. The second floor supported on timber floor joists has elevator access. The concrete slabs and trench drains vary from poor to good condition. Concrete exposed to the former animal processing areas are in poor condition.

For the purposes of this report, refer to the attached key plan for the different areas into which the building has been divided: Area 1 through Area 8. Divisions are based on construction type and the different phases of construction. Original occupancy of the facility varied from general office space, processing areas, mechanical spaces, shipping, and dry storage. Removal of ventilation and mechanical equipment from the roof and walls, as well as dislodged doors, have led to water infiltration and significant local deterioration. The poor condition of the roof has also led to water infiltration and significant local deterioration.

Recommendations presented in the report reflect the minimum effort to repair, reinforce and stabilize the building structurally. Other recommendations reflect the minimum effort to re-establish the building envelop preventing water infiltration, as well as upgrading insulation of the roof and walls to meet the intent of the International Energy Conservation Code. No mechanical, electrical or plumbing systems are salvageable.

In summary the facility is generally structurally sound and therefore suitable for adaptive reuse. Despite numerous areas of damage, neglect, deterioration, improper alterations and local failure, the building can be repaired and reconstructed to suit the desired reuse and occupancy. Architectural and engineering design services, including mechanical, electrical and plumbing would be required to advance this rehabilitation project to the next phase. The next phase is anticipated to be schematic design for the desired reuse in conjunction with the structural stabilization and re-establishment of the building envelope. See the attached "Opinion of Probable Construction Cost" at the end of the report



© 2016 Google

Google Earth

1989

Imagery Date: 4/9/2017 38°20'03.99" N 75°13'04.81" W elev 31 ft eye alt 496 ft



Photo 1



Photo 3



Photo 2



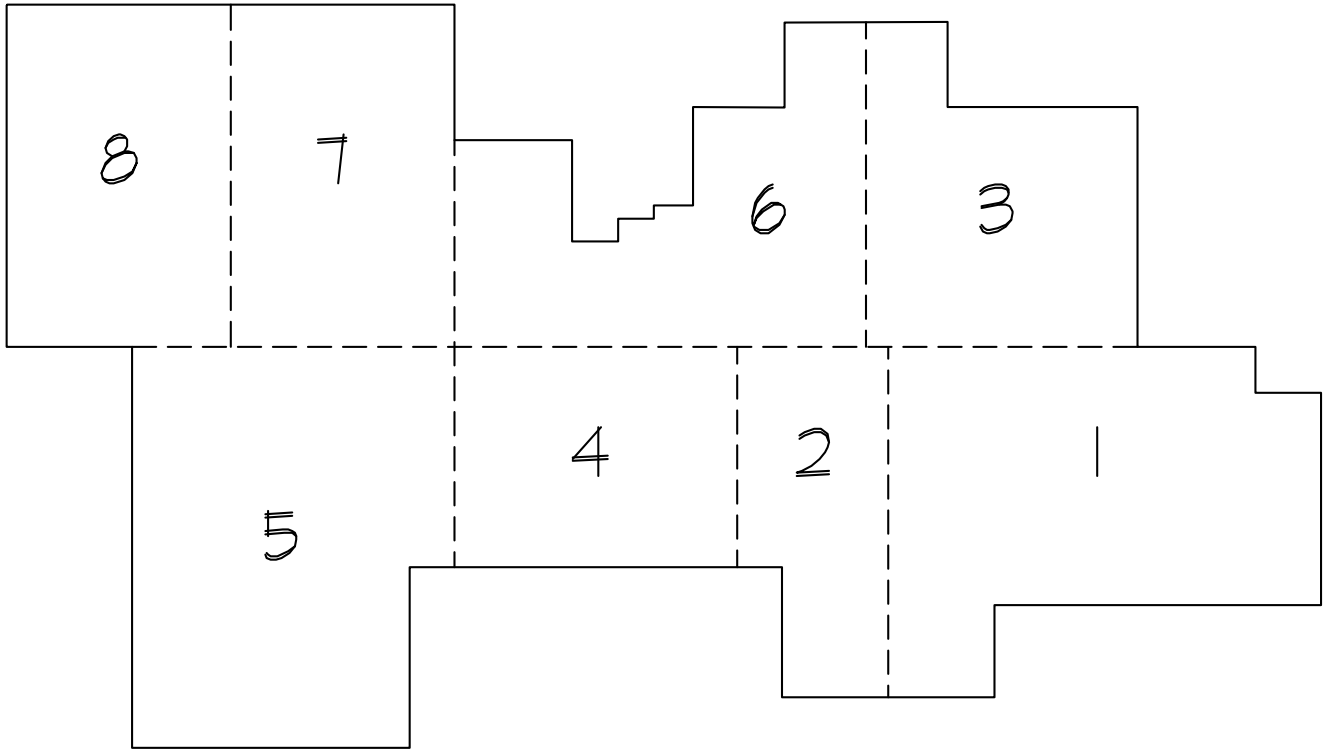
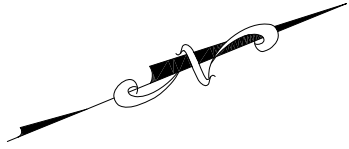
Photo 4



**Photo 5**



**Photo 6**



## BUILDING KEY PLAN

N.T.S.



DAVIS  
BOWEN &  
FRIEDEL, INC.

ARCHITECTS, ENGINEERS & SURVEYORS  
SALISBURY, MARYLAND ■ MILFORD, DELAWARE  
410.543.9091 302.424.1441

### BERLIN FALLS PARK

### Berlin, MD

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Dwg.No.:

### sk-1

Date: 5/26/2017

Scale: AS NOTED

Proj.No.: 0050A105.A01

## **AREA 1**

### **Observations and Conclusions:**

1. The primary structural framing consists of precast prestressed concrete roof tees, beams and columns. The building is enclosed with concrete block masonry curtain walls. Building Area 1 is in fair to good condition.
2. Minor deterioration and corrosion of reinforcing steel in the precast concrete building components were observed. Refer to Photo 1.
3. Open roof mounted HVAC equipment allow water infiltration into the building. Refer to Photo 2.
4. Roof leaks have resulted in staining, minor efflorescence and deterioration of the concrete roof framing. Refer to Photos 3 through 6.
5. Large spalls exist in the concrete floor slab. Overall the floor slab is in fair condition. Refer to Photo 7.
6. There are floor drains in the concrete slab. Refer to Photo 8.

### **Recommendations:**

1. The roofing should be replaced and all openings roofed over. The roof deck should be insulated with an R-38 minimum, continuous, PolyIso foam.
2. Minor repairs to precast concrete should be performed.
3. Repairs to the concrete slab should be performed.
4. Exterior masonry walls should be repaired.
5. Exterior walls should be insulated.
6. Exterior doors should be replaced or infilled.

## **AREA 2**

### **Observations and Conclusions:**

1. Area 2 is comprised of two levels. The second floor previous occupancy was office and light storage. The second floor office area is supported by precast prestressed concrete plank. The light storage floor is comprised of timber floor joists, steel beams and steel columns.
2. The precast concrete planks supporting the office appear to be in good condition.
3. The timber floor joists and timber decking supporting storage are in fair to poor condition. Poor areas are the result of water damage due to roof leaks. Refer to Photos 1 through 2.
4. The steel columns are in fair to poor condition. Portions of the columns exhibit significant corrosion, severe pitting and delamination. Refer to Photos 3 through 8.
5. The roof is supported on open web steel joists and steel roof decking. The joists and decking are in fair to good condition. Refer to Photos 9 and 10.

6. The elevator roof is open and allowing water infiltration. Refer to Photo 11.

**Recommendations:**

1. Minor repairs to the steel roof decking may be required, especially at roof leaks. Openings in the decking shall be filled in.
2. The roofing should be replaced and all openings roofed over. The roof deck should be insulated with an R-38 minimum, continuous, PolyIso foam.
3. The timber floor decking should be replaced.
4. Extensive repair and replacement of the timber floor joists may be required.
5. The steel columns and beams should be uncovered, inspected and sand-blasted cleaned, repaired and or reinforced. The steel columns and beams should be painted.

**AREA 3**

**Observations and Conclusions:**

1. The primary structural framing consists of precast prestressed concrete roof tees, beams and columns. The building is enclosed with concrete block masonry curtain walls. Building Area 3 is in fair to poor condition.
2. Minor deterioration and corrosion of reinforcing steel in the precast concrete building components were observed. Refer to Photos 1 and 2.
3. Open roof mounted HVAC equipment allows water infiltration into the building. Refer to Photos 3 and 4.
4. Roof leaks have resulted in staining, minor efflorescence and deterioration of the precast concrete roof framing. Refer to Photo 5.
5. Exterior concrete masonry walls are in poor condition. Foundation settlement is apparent. Headers are not properly supported. At least one exterior pilaster is disconnected and displaced from the exterior wall. Refer to Photos 6 through 8.
6. There is significant deterioration of the concrete floor slab and trench drains. Refer to Photos 9 & 10.

**Recommendations:**

1. The roofing should be replaced and all openings roofed over. The roof deck should be insulated with an R-38 minimum, continuous, PolyIso foam.
2. Minor repairs to precast concrete should be performed.
3. Repairs to the concrete slab should be performed.
4. Significant repairs or complete replacement of the exterior wall should be performed.
5. Exterior walls should be insulated.
6. Exterior doors should be replaced or infilled.

## **AREA 4**

### **Observations and Conclusions:**

1. The roof system is comprised of steel roof decking, open web steel roof joists, steel beams and steel columns. Some beams and columns are encased. Refer to Photos 1 and 2.
2. Exterior walls are concrete block masonry with some interior glazed block. Refer to Photo 3.
3. Roof drains are leaking. Refer to Photo 4.
4. The roof decking is in fair to poor condition with some areas of significant deterioration especially around roof drains. Refer to Photos 5 and 6.
5. The open web steel joists are short span and therefore light duty. Member thicknesses are as little as 1/8 inch. Corrosion has caused a significant reduction in member capacity. Refer to Photos 7 and 8.
6. Some open web joist diagonals have been damaged. Refer to Photo 9.
7. The bottom chord of at least one joist broken. Refer to Photo 10.
8. The bottom chords of many joists have been altered by drilling and welding. Refer to Photo 11.
9. The joists are therefore in generally poor to failed condition.
10. Holes have been cut into the webs of some steel beams. Refer to Photo 12.
11. The steel columns are in fair to poor condition. Portions of the columns exhibit significant corrosion, severe pitting, impact damage and delamination. Refer to Photos 13 through 16.
12. Openings have been cut in the exterior concrete masonry wall without headers. Refer to Photos 17 through 20.
13. Steel headers in the exterior wall have been affected by corrosion, swelled and cause some vertical displacement in the wall. Refer to Photos 21 and 22.
14. One interior wall opening header has been affected by corrosion and is distorted. Refer to Photo 23.
15. One interior wall opening header does not appear to adequate. Refer to Photo 24.
16. The roofing should be replaced and all openings roofed over. The roof deck should be insulated with an R-38 minimum foam insulation.
17. The concrete floor slab is in fair condition.

### **Recommendations:**

1. Numerous areas of the steel roof decking should be replaced or completely replaced.
2. All open web steel roof joists should be replaced and or reinforced.
3. Numerous steel beams will need to be reinforced.
4. The steel columns should be sand-blasted cleaned and repaired/reinforced.
5. Headers should be installed in exterior wall openings. Corroded exterior wall headers should be cleaned painted and sealed.
6. Interior wall opening header should be repaired and one replaced.



7. Minor repairs to the concrete floor slab should be performed.
8. The roofing should be replaced and all openings roofed over. The roof deck should be insulated with an R-38 minimum, continuous, PolyIso foam.

## **AREA 5**

### **Observations and Conclusions:**

1. The primary structural framing consists of precast prestressed concrete roof tees, beams and columns. The building is enclosed with insulated metal panel curtain walls Building Area 1 is in fair to good condition.
2. Minor deterioration of the precast concrete building components were observed. Refer to Photo 1.
3. The insulated metal panel walls appear to be in good condition.
4. Roof leaks have resulted in staining and minor efflorescence of the concrete roof framing. Refer to Photo 3.
5. Spalls and heavy scaling exist in the concrete floor slab, especially around trench drains. Overall the floor slab is in fair condition. Refer to Photo 2.

### **Recommendations:**

1. Minor repairs to Area 5 should be anticipated.
2. Minor repairs to precast concrete should be performed.
3. Minor repairs to the concrete floor slab should be performed.
4. The roofing should be replaced and all openings roofed over. The roof deck should be insulated with an R-38 minimum, continuous, PolyIso foam.

## **AREA 6**

### **Observations and Conclusions:**

1. Area 6 former use was Boiler Room and Mechanical Shop.
2. The roof system is comprised of steel roof decking, open web steel roof joists, steel beams and steel columns.
3. Exterior walls are concrete block masonry.
4. The steel roof deck over the old Mechanical Shop is in poor condition. Refer to Photos 1 & 2.
5. The open web steel joists supporting the roof of the old Mechanical Shop are in fair condition. Refer to Photo 3.
6. The roof decking and steel joists over the old Boiler Room are in a severely deteriorated condition. Refer to Photo 4.

**Recommendations:**

1. Significant roof deck replacement will be required over the Mechanical Shop. The roofing should be replaced and all openings roofed over. The roof deck should be insulated with an R-38 minimum, continuous, PolyIso foam.
2. The roof system over the Boiler Room should not be put back into service and should be completely demolished.
3. Exterior walls of Boiler Room should be reconstructed.

**AREA 7****Observations and Conclusions:**

1. The roof system is comprised of long span open web steel roof joists and steel roof decking. The roof system appears to be in fair to good condition. Refer to Photos 1 through 3.
2. Masonry walls appear to be in good condition.

**Recommendations:**

1. The roofing should be replaced and all openings roofed over. The roof deck should be insulated with an R-30 minimum, continuous, PolyIso foam.

**AREA 8****Observations:**

1. The roof system is comprised of open web steel roof joists, steel beams, steel columns and steel roof decking. The roof system appears to be in fair to good condition. Refer to Photos 1 & 2.
2. Open roof mounted HVAC equipment allows water infiltration into the building. Refer to Photo 3.
3. Interior walls appear to be non-load bearing, however interior shear walls will likely be required to remain in service. Masonry walls appear to be in good condition. Refer to Photo 4.

**Recommendations:**

1. The roofing should be replaced and all openings roofed over. The roof deck should be insulated with an R-30 minimum, continuous, PolyIso foam.

## **ROOFING**

### **Observations and Conclusions:**

1. The condition of the roofing varies significantly throughout the facility. Due to lack of regular maintenance and repair, numerous roof leaks have developed. Insulation is likely saturated with water. The overall condition of the roofing is therefore rated as poor.
2. Standing water is common throughout the facility. Refer to Photos 1 through 5.
3. Mature vegetation exists in numerous areas. Refer to Photos 6 through 12.
4. There are some areas of roofing failure. Refer to Photos 13 & 14.
5. Parapet copings and flashing are in poor condition. Refer to Photos 15 & 16.

### **Recommendations:**

1. Area 1 through Area 8 should be re-roofed. This will require removal of abandoned HVAC equipment, other mechanical systems, debris and vegetation. Some areas will require removal of stone ballast.
2. Insulation shall be removed to the roof deck and the roof deck repaired or replaced as required.
3. Roof drains, piping, downspouts and gutters shall be replaced.
4. New insulation shall be installed, R-30 minimum, continuous, PolyIso foam.
5. New roofing should be EPDM membrane or TPO, thermoplastic polyolefin.
6. Parapet wall flashings, scuppers and copings should also be replaced.

## **EXTERIOR**

### **Observations and Conclusions:**

1. The building exterior curtain wall cladding varies from concrete block, metal panel, insulated metal panel, brick masonry and EIFS.
2. Numerous areas of concrete block masonry has deteriorated due to settlement, impact damage and water erosion. Refer to Photos 1 through 5.
3. Large sections of concrete block masonry wall are in a severely deteriorated condition. Refer to Photo 6.
4. Metal panel wall siding has been installed as a temporary measure to cover demolished sections of the building. Refer to Photo 7.
5. Insulated metal wall panels are in fair condition with some areas of deterioration. Photos 8 through 10.
6. Brick veneer and EIFS are in fair to good condition with some area of water infiltration, deterioration and organic growth. Photos 11 through 16.

**Recommendations:**

1. The entire building exterior will require varying levels of repair and replacement.
2. Masonry wall openings will require infill and numerous lintels installed.
3. Significant repairs to damaged and deteriorated masonry walls should be made.
4. Cracked units and open mortar joints should be repointed. All control joint sealants should be replaced.
5. All doors in concrete block portions shall be replaced.
6. Newly installed metal panel wall siding attachment should be evaluated and properly connected.
7. Insulated metal wall panels should be repaired and recoated.
8. Minor brick repairs should be made as well as EIFS repairs and EIFS joints replaced.
9. Window and storefront sealants should be replaced.
10. All exterior curtain wall insulation should be upgraded to R-20 minimum.

**DISCLAIMER**

Our evaluation does not include structural analyses of any building components or their connections. Our evaluation is limited to a condition assessment of building elements that were easily accessible on the day of the inspection. Davis, Bowen & Friedel, Inc. takes no responsibility for any damage or deterioration not detectable by visual inspection. Neither our evaluation nor this report should be construed as a warrantee of the building either in part or in whole.



Photo 1



Photo 3



Photo 2



Photo 4



Photo 5



Photo 7



Photo 6



Photo 8



Photo 1



Photo 3



Photo 2



Photo 4



Photo 5



Photo 7



Photo 6



Photo 8





Photo 9



Photo 11



Photo 10



Photo 1



Photo 3



Photo 2



Photo 4



Photo 5



Photo 7



Photo 6

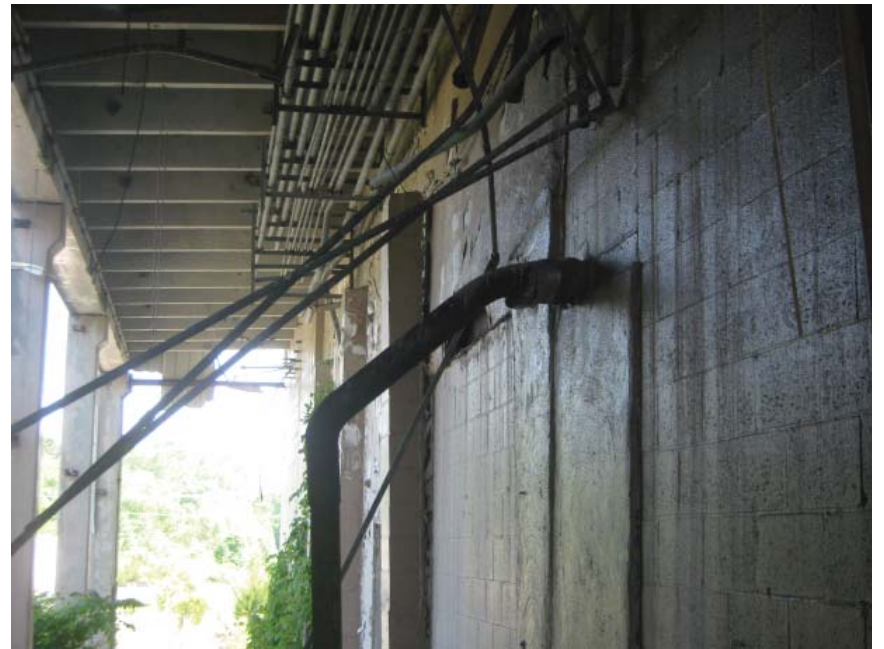


Photo 8



Photo 9



Photo 10



Photo 1



Photo 3



Photo 2



Photo 4



Photo 5

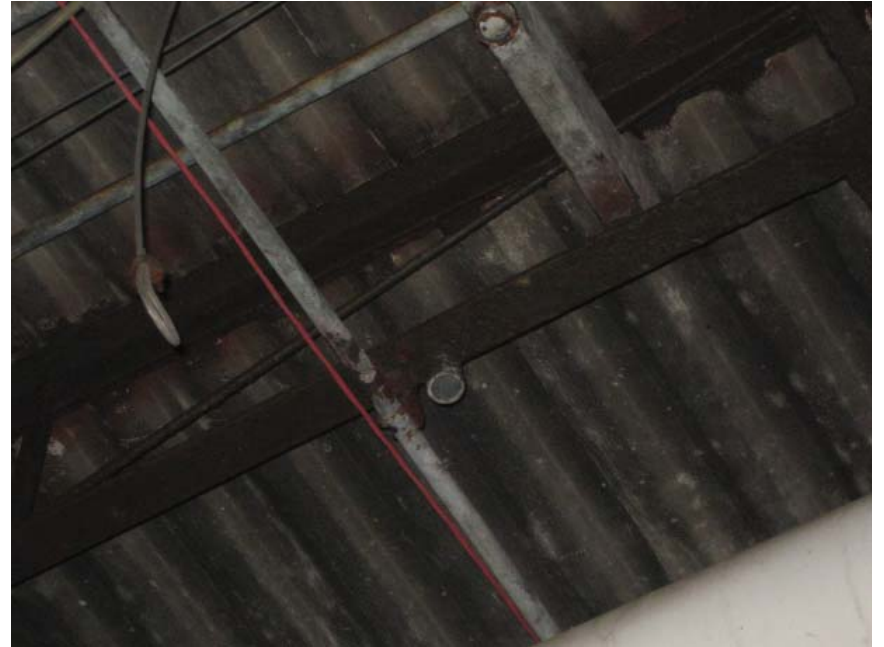


Photo 7



Photo 6



Photo 8



Photo 9



Photo 11



Photo 10



Photo 12



Photo 13



Photo 15



Photo 14



Photo 16





Photo 17



Photo 19



Photo 18



Photo 20



Photo 21



Photo 23



Photo 22



Photo 24



Photo 1



Photo 2



Photo 1



Photo 3



Photo 2



Photo 4



Photo 1



Photo 3



Photo 2



Photo 1



Photo 3



Photo 2



Photo 4



Photo 1



Photo 3



Photo 2



Photo 4



Photo 5



Photo 7



Photo 6



Photo 8





Photo 9



Photo 11



Photo 10



Photo 12



Photo 13



Photo 15



Photo 14



Photo 16



**Photo 1**



**Photo 3**



**Photo 2**



**Photo 4**



Photo 5



Photo 7



Photo 6



Photo 8



**Photo 9**



**Photo 11**



**Photo 10**



**Photo 12**



Photo 13



Photo 15



Photo 14



Photo 16

**OPINION OF PROBABLE CONSTRUCTION COSTS**  
**BERLIN FALLS PARK BUILDING STABILIZATION**

FOR  
**TOWN OF BERLIN, MARYLAND**

**PRE-DESIGN SERVICES**  
 PREPARED BY:  
 DAVIS, BOWEN & FRIEDEL, Inc.  
 DBF #0050A105.A01 DATE: JUNE 16, 2017

ITEM	UNIT	QUANTITY	PRICE	PRICE
<b>1. MOBILIZATION / GENERAL CONDITION</b>	LS	1	\$98,760	<b>\$98,760</b>
<b>2. DEMOLITION</b>				
A. REMOVE MISC. HVAC EQUIP. & DEBRIS	LS	1	\$10,000	\$10,000
B. REMOVE BATT INSUL FROM WALLS	LS	1	\$2,000	\$2,000
C. REMOVE ROOFING & STONE	SF	65,000	\$4	\$260,000
D. REMOVE CONCRETE MASONRY WALLS	SF	3,000	\$2	\$6,000
E. CLEANING & ENVIRONMENTAL	LS	1	\$20,000	\$20,000
F. WASTE DISPOSAL	TON	350	\$80	\$28,000
			<b>SUB-TOTAL</b>	<b>\$272,000</b>
<b>3. STRUCTURAL REPAIRS</b>				
A. PRECAST CONCRETE	LS	1	\$5,000	\$5,000
B. AREA 4 ROOF FRAMING	SF	6500	\$10.00	\$65,000
C. AREA 6 ROOF FRAMING	SF	2400	\$10.00	\$24,000
D. STEEL COLUMNS & BEAMS	LS	1	\$25,000	\$25,000
E. CLEAN & PAINT STEEL	LS	1	\$50,000	\$50,000
			<b>SUB-TOTAL</b>	<b>\$169,000</b>
<b>4. EXTERIOR WALLS &amp; INTERIOR FLOORS</b>				
A. REPAIR CONCRETE BLOCK WALLS	LS	1	\$20,000	\$20,000
B. REPLACE CONCRETE BLOCK WALLS	SF	3,000	\$25	\$75,000
C. REPAIR INSULATED WALL PANEL	SF	1,500	\$2	\$3,000
D. REPLACE INSULATED WALL PANEL	SF	1,400	\$25	\$35,000
E. REPAIR EIFS	LS	1	\$2,000	\$2,000
F. INSULATE EXTERIOR WALLS	SF	20000	\$3.00	\$60,000
G. GUTTERS & DOWNSPOUTS	LS	1	\$10,000	\$10,000
H. INSTALL NEW ENTRY DOORS	EA	4	\$2,000	\$8,000
I. REPAIR STOREFRONT	LS	1	\$5,000	\$5,000
J. REPAIR INTERIOR CONCRETE SLABS	LS	1	\$10,000	\$10,000
K. REPAIR WOOD FLOOR	SF	3,300	\$10	\$33,000
			<b>SUB-TOTAL</b>	<b>\$261,000</b>
<b>5. ROOFING</b>				
A. CLOSE IN OPENINGS	EA	20	\$500.00	\$10,000
B. REPLACE COPING / PARAPET CAP	LF	1,800	\$40.00	\$72,000
C. NEW ROOFING				
-INSULATION	SF	65,000	\$8	\$520,000
-ROOFING	SF	65,000	\$5	\$325,000
-WALK PADS & MISC.	LS	1	\$10,000	\$10,000
D. LADDERS	EA	4	\$500	\$2,000
E. ROOF DRAINS & PIPING	LS	1	\$5,000	\$5,000
			<b>SUB-TOTAL</b>	<b>\$944,000</b>
			STABILIZATION SUB-TOTAL	\$1,744,760
			15% CONSTR. CONTINGENCY	\$261,714
			<b>TOTAL</b>	<b>\$2,006,474</b>
<b>DESIGN CONTINGENCIES</b>			15% DESIGN CONTINGENCY	\$300,971
			<b>GRAND TOTAL</b>	<b>\$2,307,445</b>

## BERLIN Tyson plant

Technical Report Prepared by Ellen Silbergeld, Jim Hulbert, Jane Kreiter, and Jennifer Nyland

This project was undertaken to assist the Town of Berlin in assuring the safety of repurposing the former Tyson Poultry slaughter and processing plant. The site is now owned by the town of Berlin Maryland, which plans to redevelop the site for community recreational purposes. The issue under investigation by us related to the potential presence of pathogenic bacteria at this site related to its former use.

### BACKGROUND INFORMATION (FROM JANE KREITER)

The site was formerly occupied by a Tyson poultry slaughter and processing plant. There is extensive information of the presence of bacteria in these operations, including pathogenic organisms capable of causing diseases in humans. There is no indication that steps were taken by Tyson during plant activity [such steps are not required by state or federal regulation]. Since the plant closing, no remediation or cleanup was conducted inside the buildings or at the site.

Reason for concern: Of greatest concern, the site includes several ponds into which slaughter house wastes were disposed over the course of operation. Because the ponds have remained filled, they are likely to contain bacteria representing past uses. We focused on those pathogens carried by poultry that are capable of causing disease in humans. Moreover, because of the use of antibiotics in poultry feed, many studies, including research conducted in MD by the University of MD and our group have reported that antibiotic resistant pathogens are present on poultry at farms and on broiler chickens transported from farms to slaughter. The organisms of greatest concern, all of which have been reported with a high prevalence in poultry production are listed below. For cost reasons, as well as knowledge of the likelihood of persistence, we focused on *E coli*.

*Campylobacter jejuni*

*Enterococcus species*

*Staphylococci aureus*

*E. coli*

*Klebsiella*

The flow from the chicken processing plant went through a pretreatment facility that was located inside the existing building. The flow then went to the round clarifier that is located South of the South Lagoon. From there it entered the South Lagoon on the East side where it was aerated. Then it flowed to the other side of south Lagoon where the floating vegetated barges are. From the Southern lagoon the flow went to the middle lagoon and then to the North lagoon. Prior to discharge into Kitts Branch the effluent went through a filter which was located in the building on the land located



between the middle and north lagoons. Chlorination and dechlorination occurred in the small cells adjacent to the building

These ponds are shown below (map from EA). Reading from top to bottom of this figure, the slaughter house waste was first discharged into the round holding reservoir shown at the bottom. From there, liquids were pumped into the small pond with plant flotation devices. This pond drained into the larger pond at the top of the figure and eventually runoff was discharged into a natural stream on the right on the ponds.



### STUDY DESIGN (ELLEN SILBERGELD )

We proposed a limited study of sediments in the ponds currently on the site since no analysis for pathogenic strains have been conducted. Owing to funding constraints, we focused on *E coli* a family of microorganisms that includes highly pathogenic strains.

Using information provided by EA and the Town of Berlin, we proposed to take sediment samples at three points within the first discharge pond on the map below. We did not sample from the holding reservoir.



These samples were collected by EA as described below, using standard methods prior to any drainage of water, removal of sediments or plants, or other disturbance of the bottom sediments. The cores were handled by scientists at Salisbury University, following protocols developed in the Brush laboratory at JHU and utilized by us in sampling river sediments in the Pocomoke River watershed. The cores were prepared for sectioning and storage using the same protocols.

### **SEDIMENT PROBE SAMPLING INVESTIGATION (conducted by Jim Hulbert, EA)**

EA conducted a series of sediment probes at 25 pre-determined locations within the three wastewater management lagoons between 30 March and 31 March 2017. The probe data were used to identify the elevation of the water and sediment surfaces, as well as the elevation of the firm subgrade material at each location.



The Trimble R8S GNSS unit was mounted to the top of a fiberglass probe to provide horizontal and vertical positioning in the Maryland State Plane coordinate system (Figure 3-3). At each location, the probe was pushed into the sediment until refusal was met, or until the probe reached its full extent of 13.1ft. Three positional fixes were logged at each location: (1) water surface, (2) top of sediment, and (3) bottom of sediment. By obtaining three positional fixes, the water depth and overall thickness of the fine-grained sediment overburden was calculated for each location based on the difference of the various elevation values.

### **SEDIMENT CORE SAMPLING INVESTIGATION (EA)**

The objective of the sediment coring effort was the collection of intact, cross-sectional samples in order to examine the sediment strata within the wastewater management lagoons. Twelve (12) locations established in a previous phase of the Site characterization were re-occupied for the collection of sediment core samples in order to sample the fine-grained material of concern (Figure 3-4). On 30 March and 31 March 2017, a 2.75-inch diameter piston corer was utilized by EA to collect 12 core samples and two duplicate core samples throughout the lagoons to a maximum depth of 5 ft below the sediment surface (Figure 3-5). Sediment core samples included:

- Four samples located within the north lagoon (SC-1N; SC-3N; SC-5N; SC-9N)
- Four samples located within the middle lagoon (SC-2S; SC-5S; SC-8S; SC-9S)

- Two samples located within the western half of the south lagoon (WWP-1; WWP-2)
- Two samples located within the eastern half of the south lagoon (WWP-3; WWP-4)

*Additionally, two duplicate core samples were collected from the western half of the south wastewater lagoon (WWP-1.1; WWP-2.1) for the purpose of microbiological analyses. Sampling locations were located via GNSS by EA prior to sampling and are presented in Figure 2 above.*

#### CORE PROCESSING (Salisbury University)

Dr Nyland received two core samples collected at the locations designated (Samples #WWP1 and WWP2) between 10:15 and 10:50am on 03/31/2017. The core samples were stored on ice and transported immediately to Salisbury University for subsampling and DNA isolation. The cores were opened under sterile conditions and subsamples (50ml volume) collected from the top (within the first 5 inches of the top) and bottom (within the first 3 inches of the bottom) of each core. DNA was isolated from these subsamples using Qiagen DNeasy PowerSoil isolation kits according to the manufacturer's instructions. Isolated DNA was stored at -80°C until transport to Johns Hopkins for microbial genetic analyses. DNA samples were sent to Johns Hopkins on dry ice via FedEx.

#### DNA ANALYSIS (Johns Hopkins Bloomberg School of Public Health)

The frozen DNA samples were thawed using standard methods at Johns Hopkins. The identification of E coli was performed by polymerase chain reaction analysis of the DNA samples. The reactions were carried out on a StepOne Real-Time PCR system. The primers and probe were published in "Development of two real-time multiplex PCR assays for the detection and quantification of eight key bacterial pathogens in lower respiratory tract infections," detailing two real-time multiplex PCR assays for detection of bacterial pathogens ([hyperlink here](#)). The total volume of each reaction was 20 µl -- 10 µl 2X Veriquest USB Probe Master Mix; 1 µl of each primer (10 µM); 0.5 µl probe (10 µM); 2.5 µl ultrapure water; 5 µl DNA template. The DNA samples were tested neat (5 µl of bacterial DNA) and dilute (5 µl of 1:10 dilution of bacterial DNA). The published protocol we use to test for E. coli DNA in samples is actually a real time PCR assay and the results are expressed as cycle thresholds (CTs) for each of the samples. The CT is defined as the number of cycles (or amplifications) required to detect a fluorescent signal about background. Positive controls were run for each assay.

#### RESULTS

The two positive control samples had CTs of 18.3 and 21.7. "Unknown" means that after 40 cycles there was no fluorescent signal indicating a negative result. Only Sample 2 (neat, that is, no dilution) was positive with a CT of 37.5. The maximum

number of cycles in this real-time assay is 40. While the CT is high (as expected for a nondiluted sample), it is not outside the range of the assay.

Block Type: 96well  
 Chemistry: TAQMAN  
 Experiment: F:\2017-06-13 Silbergeld samples EC.ed  
 Experiment: 2017-06-13 12:20:50 PM EDT  
 Instrument: steponeplus  
 Passive: RrROX

Well	Sample Name	Target	Nai	Task	Reporter	Quencher	Cr	Cr Mean	Cr SD	Quantity	Quantity M	Quantity S	Automatic	Cr Thresh	Automatic	Baseline	Baseline	Start	Baseline	End	Comments	HIGHSD	NOAMP	EXPFAIL
A2		ecoli	NTC	FAM	NFQ-MGB	Undetermined							FALSE	0.05	TRUE			3	39		N	N	N	
B2		ecoli	NTC	FAM	NFQ-MGB	Undetermined							FALSE	0.05	TRUE			3	39		N	N	N	
A1	Sample 1 (neat)	ecoli	UNKNOWI	FAM	NFQ-MGB	Undetermined							FALSE	0.05	TRUE			3	39		N	N	Y	
B1	Sample 1 (1:10)	ecoli	UNKNOWI	FAM	NFQ-MGB	Undetermined							FALSE	0.05	TRUE			3	39		N	N	Y	
F1	Sample 2 (neat)	ecoli	UNKNOWI	FAM	NFQ-MGB	37.5	37.5						FALSE	0.05	TRUE			3	34		N	N	N	
G1	Sample 2 (1:10)	ecoli	UNKNOWI	FAM	NFQ-MGB	Undetermined		37.5					FALSE	0.05	TRUE			3	39		N	Y	Y	
A3	Positive Ctrl 1:100	ecoli	UNKNOWI	FAM	NFQ-MGB	18.3	20.0						FALSE	0.05	TRUE			3	14		Y	N	N	
B3	Positive Ctrl 1:1000	ecoli	UNKNOWI	FAM	NFQ-MGB	21.7	20.0						FALSE	0.05	TRUE			3	19		Y	N	N	

## CONCLUSIONS

Based on this analysis, we conclude that there is no evidence for the presence of bacteria of health concern at the site sampled.