west virginia department of environmental protection

Division of Water and Waste Management
601 57th Street SE
Charleston, WV 25304
Phone: (304) 926-0495
Fax: (304) 926-0463

Jim Justice, Governor
Austin Caperton, Cabinet Secretary
www.dep.wv.gov

October 06, 2017

Roger Goodwin, PE, CFM
Director & Chief County Engineer
Jefferson County Department of Engineering, Planning & Zoning
P.O. Box 716
116 East Washington Street, Suite 100
Charles Town, WV 25414

CERTIFIED RETURN RECEIPT REQUESTED

Re: Decommission Irrigation Lagoon & Sinkhole Remediation Plan for Bardane Industrial Park

Dear Mr. Goodwin:

The proposal received by this office on the 31th day of August 2017, decommission the sewage irrigation lagoon and remediate the sinkhole on property owned by Jefferson County Commission, has been reviewed.

The agency does not object to this remediation plan so long as the facility adheres to the following conditions:

1. The work shall be performed in accordance with the letter, and all attachments, as presented, in the correspondence, dated August 31, 2017.

2. The sinkhole will be remediated in accordance with the applicable guidelines in the WVDEP Sinkhole Mitigation Guidance document.

3. All materials and equipment required to perform the work shall be on site prior to the initiation of the work activities.

4. The work activities shall be managed in a manner that will provide for the maximum alleviation of impact to, and maximum protection of, aquatic life and human health.

5. The work activity, once initiated, shall be performed continuously, if necessary, until completed.

6. Jefferson County shall notify Environmental Enforcement's District field office, at 304-822-7266, 24 hours prior to the initiation of any procedures. This will afford the Department with an opportunity to have personnel available to observe the activities. Jefferson County shall, further, notify the Emergency Response Spill Alert System at 1-800-642-3074, prior to, and upon conclusion, of any bypass event, or further, upon any spill incident.

Upon completion of the remediation, the entire disturbed area must be seeded and fertilized to establish a vegetative cover on the site.

While the Division is understanding of the need to perform this work, this correspondence shall not constitute an affirmative defense in any enforcement action brought against Jefferson County, or any contractors used, for violations from the performance of the work activities.

If you have any questions, please feel free to contact Brian Bailey at (304) 926-0499 ext 1021.

Sincerely,

Scott G. Mandirola
Director

SGM/bdb

cc: Env. Insp. Supervisor
Env. Inspector (Jefferson County)
Connie Anderson, Supervisor, Groundwater and Stormwater Team
John Perkins, Supervisor, General Permits and Support Team
Yogesh Patel, Engineer Chief, Permitting, DWWM
Bill Herold, Bureau for Public Health

JEFFERSON COUNTY, WEST VIRGINIA
Department of Engineering, Planning & Zoning
Offices of
Engineering / Building Permits & Inspections / Floodplain Management
116 East Washington Street, Suite 100
P.O. Box 716
Charles Town, West Virginia 25414

Roger Goodwin, P.E., CFM
Director, Chief County Engineer & Building Official

Phone: (304) 728-3256
Fax: (304) 728-3953
rgoodwin@jeffersoncountywv.org

TO: West Virginia Department of Environmental Protection
Division of Water & Waste

FROM: Roger Goodwin, P.E., CFM
Director & Chief County Engineer

DATE: August 31, 2017

SUBJECT: **WWTP Lagoon Decommission & Sinkhole Remediation Plan**
Bardane Industrial Park, Jefferson County

WWTP and Lagoon Decommission Violation no. w17-19-026-mkk
Sinkhole UIC Permit Violation no. w17-19-025-mkk

The following is the proposed plan to decommission the waste water treatment plant effluent discharge storage lagoon and to remediate the sinkhole at the Bardane Industrial Park in Jefferson County *(see attached location map)*, as required under the above noted West Virginia Department of Environmental Protection (WVDEP) violations:

1. The proposed plan is to decommission the lagoon by draining it, then removing a portion of north and south lagoon berms and drying out the lagoon. A new drainage swale can then be constructed from the upstream roadway culverts located at Industrial Boulevard, through the lagoon site, to a drainage swale that exists on an adjacent lot at the northern end of the lagoon. There is already a minimum 300 foot wide drainage easement *(see attached existing easement plat)* across this lot that extends to the downstream roadway culverts located at James Burr Boulevard.

2. It is understood that as part of the approval of the plan to drain the lagoon and construct a drainage swale, that we are required by the WVDEP to obtain one grab sample of the sludge/soil in the lagoon and have it tested for the following:

Arsenic	Total Nitrogen
Cadmium	Phosphorous
Chromium	Potassium
Copper	Calcium
Lead	Magnesium
Mercury	pH
Molybdenum	Percent solids (sludge only)
Nickel	Fecal Coliform (sludge only)
Selenium	Volatile Solids (sludge only)
Zinc	
Cyanide	

The results are to be submitted to the WVDEP for review.

3. The lagoon will be drained by pumping the water in the lagoon to the nearby Jefferson County Public Service District (JCPSD) pump station since the WVDEP will not allow the water in the lagoon to be discharged downstream into the stormwater drainage system.

4. Once the new drainage swale is in place, the sinkhole will then be remediated in accordance with applicable guidelines in the WVDEP's Sinkhole Mitigation Guidance document *(see attached guidelines)*. Fill will then be placed over the sinkhole and in the drainage swale that currently runs to the sinkhole. The fill will be graded toward the new drainage swale so that the stormwater runoff sheet/surface flows to the new drainage swale and not into the sinkhole *(see attached aerial site map showing proposed drainage swale)*.

5. All WVDEP permits required for the project will be obtained prior to beginning construction. All disturbed areas will be stabilized with seeding and mulch, erosion matting, check dams, etc., in accordance with the sediment and erosion control plan that is developed by the consulting engineer for this project.

6. Upon completion of all work, an inspection will be scheduled with the WVDEP.

7. A drainage easement plat will then be recorded at the county clerk's office for the new drainage swale that is constructed across the lot owned by the Jefferson County Commission (the parcel with the sinkhole and lagoon).

In summary, the overall intent of this plan is to carry the stormwater runoff from the upstream culverts at Industrial Boulevard directly to the downstream drainage and stormwater management system – thereby diverting the stormwater away from the sinkhole; which will eliminate the need for an Underground Injection Control (UIC) permit for the sinkhole.

Currently, there are approximately 307.77 acres draining to the sinkhole. When

the project is finished, we expect approximately only 1.5 acres of area will have stormwater runoff sheet flowing over the sinkhole to the new drainage swale. The other 306.27 acres will by-pass the sinkhole.

The following table is an estimated timeline for the generally anticipated steps to performing field surveying, engineering the project, bidding the work, funding the project and constructing the project. This plan/project will require a time extension on the "Rule Authorization" from the current October 1, 2017 deadline for obtaining a UIC permit for the sinkhole:

WWTP Effluent Discharge Lagoon Decommission
&
Sinkhole Remediation Project

Bardane Industrial Park
Jefferson County, WV
August 31, 2017

Project Timeline

No.	Task	Weeks
1	Get Co. Commission approval to issue RFP to Engineering consultants	3
2	Draft RFP & scope of work	2
3	Advertise Request for Proposals from Consulting Engineers	2
4	Receive RFP's and review and get Co. Commission approval to hire	4
5	Engineering consultant performs field survey, engineers design, completes construction documents, plans & specifications, obtains state & federal permits, provides cost estimate.	12
6	Get Co. Commission funding allocation and approval to bid project.	4
7	Advertise for Bids from Contractors, pre-bid conference, receive bids	6
8	Review bids and make recommendation to County Commission	3
9	Award Bid & Issue Notice of Award	1
10	Legal review construction bonds, insurance documents; issue Notice to Proceed	4
11	Construction stakeout and perform construction work	10
12	WVDEP Inspection	2
13	Close out Project & Final Payment to Contractor	2
	Estimated Total Weeks	*55*

West Virginia Department of Environmental Protection
Division of Water and Waste Management
Groundwater Protection Program

Sinkhole Mitigation Guidance

August 8, 2005

Purpose:

These sinkhole mitigation designs serve to allow the filling of sinkholes while maintaining recharge to the aquifer, reducing potential contamination threats to groundwater, and eliminating safety hazards at sinkhole entries.

General:

Consideration should be given to the method used for removing contaminated materials from sinkholes and reducing or eliminating direct inflow of surface water into sinkholes. Land treatment methods that improve the filtration and infiltration of surface water before it enters the sinkhole should be used along with the mitigation of the sinkhole.

Before selecting a treatment option the following should be considered:

- Land use
- Existing and planned land treatment
- Sinkhole drainage area
- Dimensions of the sinkhole opening
- Safe outlet for diverted surface water
- Environmentally safe disposal of sinkhole "clean out" material
- Availability and quality of filter material
- Safety of equipment and operators and laborers during installation

Treatment selection should be based on the dimensions of the sinkhole drainage area and include direct sinkhole treatment with surface water control measures and filter strips. Whichever treatment option is chosen, it should avoid surface water ponding or the creation of high soil moisture conditions in excess of 72 hours.

Treatment designs apply to sinkholes with excavated depths of 5 to 25 feet and with drainage areas up to 15 acres. Excavations up to 5 feet are sufficient for most sinkholes. Sinkholes with excavation depths of greater than 25 feet or with uncontrolled drainage areas greater than 15 acres may require adjustments to the treatment measure(s) and/or surface water control measure(s). In these cases, geologic and engineering assistance must be obtained and a site-specific treatment design prepared.

Treatment for Sinkholes with Drainage Areas Less than 5 Acres

Treat the sinkhole using the mitigation design in Figure 1 of this guidance document. The treatment site should be inspected after periods of heavy precipitation because some material may run into adjacent sinkhole voids causing a surface depression. In this case, maintenance will include adding soil material at the surface. The existing land use or practice may continue over the treated sinkhole as long as the treatment is maintained.

Treatment for Sinkholes with Drainage Areas of 5 Acres or More and Having a Safe Outlet

The following additional treatment criteria are applicable to sinkholes with drainage areas of 5 acres or more where a safe outlet can be provided to divert surface water away from the sinkhole. A safe outlet is one that does not erode, divert surface water to another sinkhole or injection well, or cause flood damage to crops, property, buildings, or highways/roads.

Surface water control measures should be situated to reduce the internal drainage area around the sinkhole to less than 5 acres. The choice of surface water control measures is generally based on site-specific conditions.

Treatment for Sinkholes with Drainage Areas of 5 to 15 acres and Having No Safe Outlet

Treat the sinkhole using the mitigation design in Figure 2 of this guidance document. The site should be inspected after periods of heavy precipitation because some material may run into adjacent sinkhole voids causing a surface depression. In this case, maintenance will include adding soil material at the surface. The sinkhole should remain as unused land.

Vegetated Buffer Area

A vegetated buffer area should be installed around the sinkhole to improve runoff water quality by filtration and adsorption of contaminants. The vegetated buffer area should be installed within the sinkhole drainage area and should begin at the treated sinkhole.

The minimum width (in feet) of the vegetated buffer area is determined by multiplying the sinkhole drainage area (in acres) by seven. This width should provide beneficial filtering for some distance outside the sinkhole because surface water runoff may be temporarily held before reaching the treated sinkhole.

Appropriate vegetation should be used for the buffer area. Use native vegetation as much as possible. **DO NOT** use noxious plants or weeds. It is recommended that a plant nursery be consulted for the appropriate vegetation.

Acceptable Materials

Engineering fabric - must meet the applicable requirements of AASHTO M-288.

Aggregates – fine aggregates, gravel, or rock rip rap that conforms to the West Virginia Department of Highways, Standard Specifications for Roads and Bridges, Sections 702, 703, and 704.

Specifications

Use the following guidance for installing a mitigation design for sinkholes and sinkhole areas with drainage areas of less than 5 acres:

1. Remove and properly dispose of materials dumped in and around the sinkhole in accordance with applicable federal, state, and local laws.

2. Excavate loose material from the sinkhole and try to expose the solution void(s) in the bottom. Enlarge the sinkhole, as necessary, to allow for installation of the filter material.

3. Select stone that is approximately 1.5 times larger than the solution void(s). Place the stone into the void(s) forming a competent bridge. Stone used for the bridge should have rock strength equal to, at least, moderately hard (*e.g.*, resistant to abrasion or cutting by a knife blade but can be easily dented or broken by light blows with a hammer). Shale or similar soft and non-durable rock is not acceptable.

4. Place a layer of filter material over the bridge to a minimum thickness of 24 inches. Approximately 35 percent of the material should be larger than the opening between the bridge and the void(s). There should be no discernable large openings around the bridge. The material should be either gabion stone, stone for rip rap, or stone for special rock fill that conforms to West Virginia Department of Highways, *Standard Specification Roads and Bridges*, Section 704.

5. Place a layer of smaller size filter material over the previous layer to a minimum thickness of 10 inches. The size of the material should be ¼ to ½ the size of that used in the previous layer. The material should be No. 57 aggregate, which conforms to West Virginia Department of Highways, *Standard Specifications Roads and Bridges*, Sections 703.1.1, 703.1.2, 703.1.3, 704.1.4, and 703.2.1. Unacceptable filter material consists of pea gravel or slags (steel, electromagnetic, or power plant).

6. Place a layer of sand-sized filter material over the previous layer ~~at~~ to a minimum thickness of 10 inches. The sand must be compatible in size with the previous layer to prevent piping. The material should be fine aggregate that conforms to West Virginia Department of Highways, *Standard Specification Roads and Bridges*, Sections 702.1.1, 702.1.2, and 702.1.3.

7. Engineering fabric conforming to AASHTO M 288 may be substituted for the stone and sand filter materials discussed in 5 and 6.

8. Backfill over the top filter layer or engineering fabric with soil material to the surface. This should be mineral soil with at least 12 percent fines. Reuse soil material excavated from the sinkhole as much as possible and place any available topsoil over the backfill. Overfill by about 5 percent to allow for settling.

9. Establish vegetation on the mitigated sinkhole and other disturbed areas of the site.

Use the following guidance for installing a mitigation design for sinkholes and sinkhole areas with drainage areas of 5 to 15 acres:

1. Remove and properly dispose of materials dumped in and around the sinkhole.

2. Excavate loose material from the sinkhole.

3. Place a layer of filter material into the sinkhole, allowing the stone to fill the void(s) below the bottom of excavated sinkhole. The size should be ¼ to ½ the size of the void(s). This material can be WVDOH gabion stone, rip rap stone, or special rock fill stone.

4. Place a layer of the same size filter material to a thickness of about ¾ TD (TD = total depth) above the sinkhole bottom.

5. Place a layer of smaller size filter material over the previous layer to a thickness of about ¼ D. Bring this layer to surface level. The size should be ¼ to ½ the size of the previous layer. The material should be No. 57 aggregate, which conforms to West Virginia Department of Highways, *Standard Specification Roads and Bridges*, Sections 703.1.1, 703.1.2, 703.1.3, 703.2.1, and 704.1.4. Unacceptable stone consists of pea gravel or slags (steel, electrometallurgical, or power plant).

6. Shale or similar soft and non-durable rock is not acceptable.

7. Establish vegetation on the mitigated sinkhole and disturbed areas of the site.

Engineering Fabric Requirements for Subsurface Drainage

Engineering fabric used in the mitigation of sinkholes should meet the applicable requirements of AASTHO M 288, Section 7.2

Engineering Fabric Installation

Proper construction and installation techniques are essential to ensure that the intended function of the engineering fabric is fulfilled.

When sewn seams are necessary, the seam strength must be equal to or greater than 90 percent of the specified grab strength, as measured in accordance with ASTM D 4632.

When sewn seams are used for the seaming of the engineering fabric, the thread must be high strength polypropylene, or polyester. Nylon thread is unacceptable.

For Sinkhole Mitigation Design A, place the engineering fabric loosely, with no wrinkles or folds, and with no void spaces between the fabric and the bridge. Overlap successive sheets of engineering fabric a minimum of 12 inches, with the upstream sheet overlapping the downstream sheet.

Prior to covering, the engineering fabric should be inspected to ensure that it has not been damaged (*e.g.* holes, tears, rips) during installation. An engineer or the engineer's designated representative should conduct the inspection. The designated representative should be a certified field inspector.

Damaged fabric must be repaired immediately. Cover the damaged area with an engineered fabric patch that overlaps to 12 inches beyond the damaged area.

Any damaged engineering fabric that cannot be repaired shall be replaced as directed by the engineer.

Place material over the engineering fabric in such a manner as to avoid stretching and subsequently tearing the fabric. Do not drop stone and soil placement from a height greater then one meter. Do not allow stone with a mass of more than 100 kg to roll down the slope of the sinkhole.

Grading the sinkhole slope is not permitted if the grading will result in the movement of the stone directly above the engineering fabric.

Operation and Maintenance

The owner/operator is responsible for maintaining the mitigated sinkhole and sinkhole area. At a minimum, the following maintenance practices should be performed:

1. Mow grass and plantings as necessary to promote vigorous growth.

2. Inspect mitigation measures at least twice a year and after all major rain events. Repairs to the sinkhole mitigation measures should be made promptly were warranted.

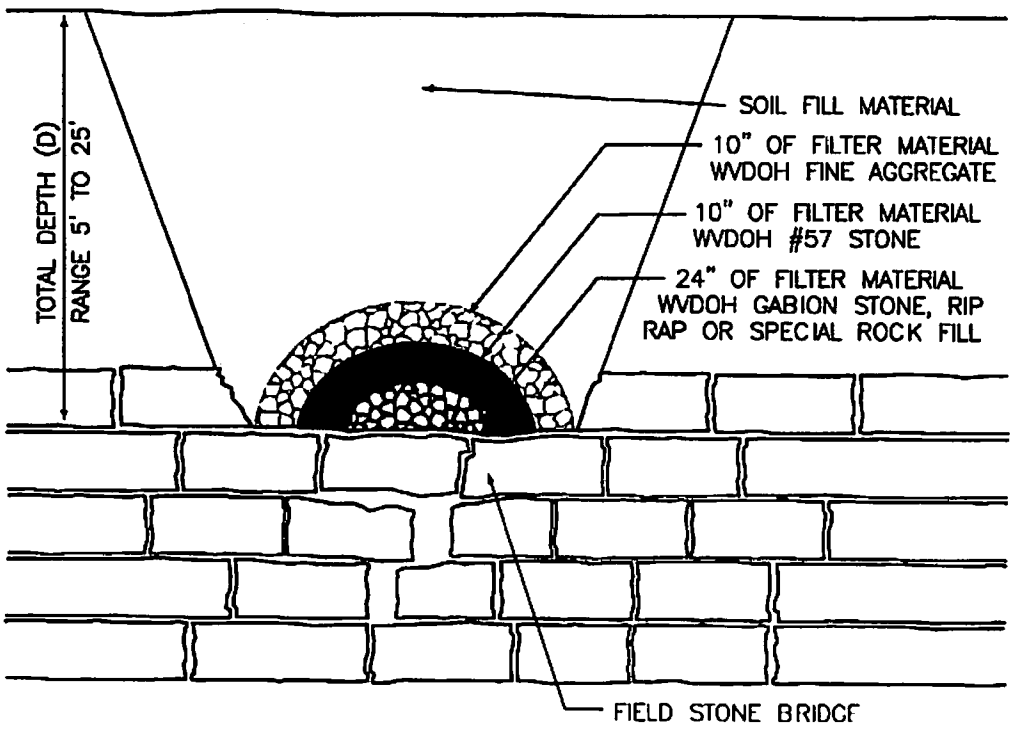
References:

USDA Natural Resources Conservation Center, January 2004. *Maryland Conservation Practice Standard, Sinkhole and Sinkhole Area Treatment, Code 725.*

West Virginia Department of *Highways, Standard Specifications Roads and Bridges*, 2000, Section 702, "Fine Aggregates", Section 703, "Coarse Aggregates", Section 704, "Stone and Crushed Aggregate", Section 715, "Miscellaneous Materials".

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
SINKHOLE MITIGATION GUIDANCE

FIGURE 1



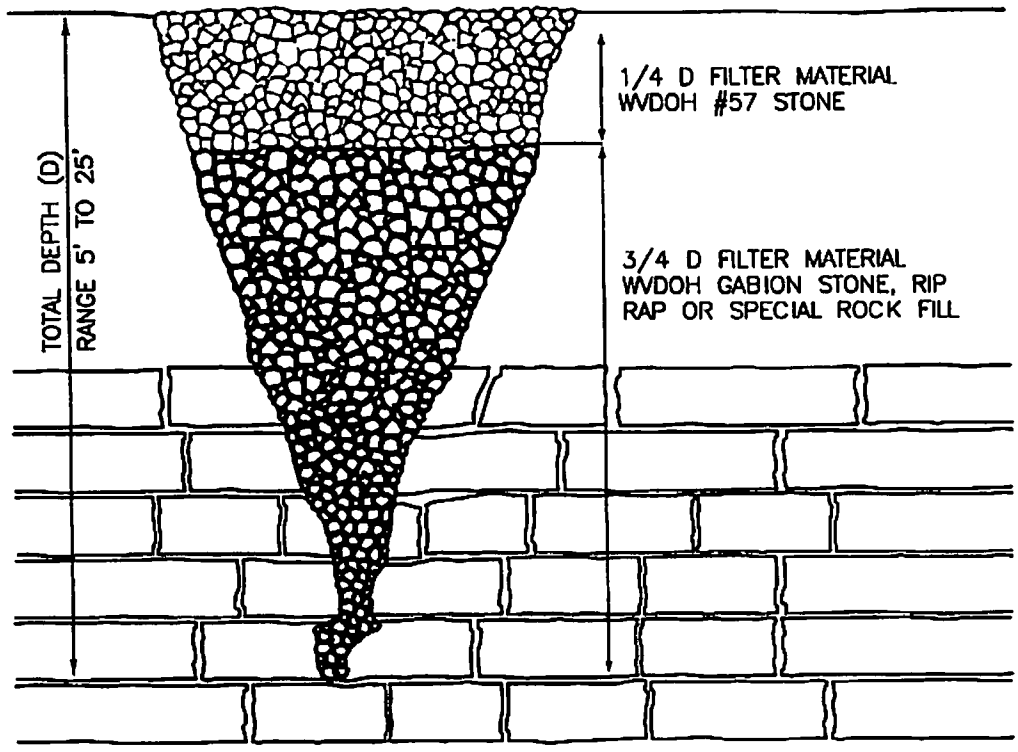
NOTE:
A NONWOVEN GEOTEXTILE MEETING AASHTO M288, SECTIONS 7.1+7.2 MAY BE SUBSTITUTED FOR THE WVDOH #57 STONE AND WVDOH FINE AGGREGATE

SINKHOLE MITIGATION

(DRAINAGE AREA LESS THAN 5 ACRES)

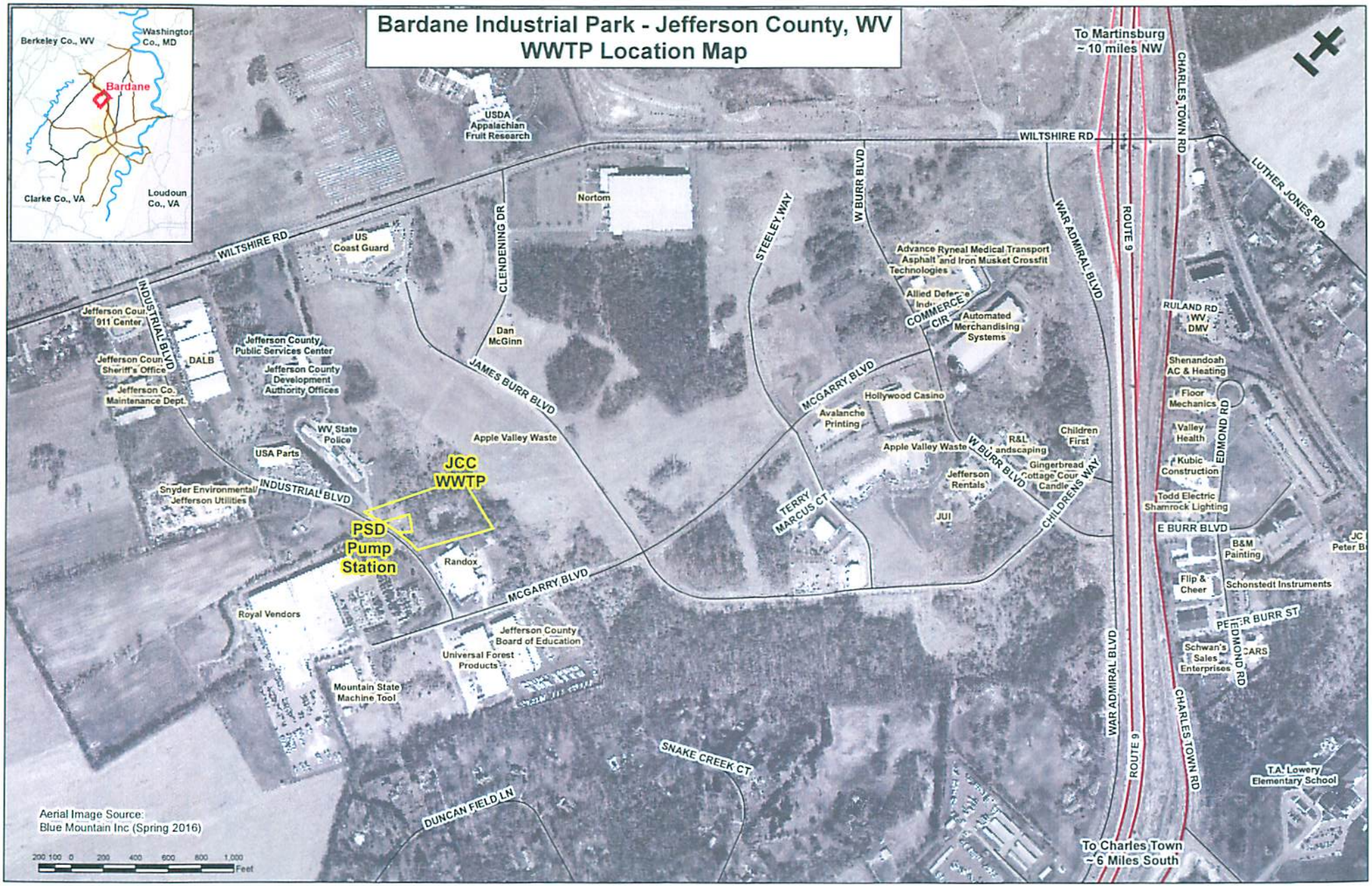
WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
SINKHOLE MITIGATION GUIDANCE

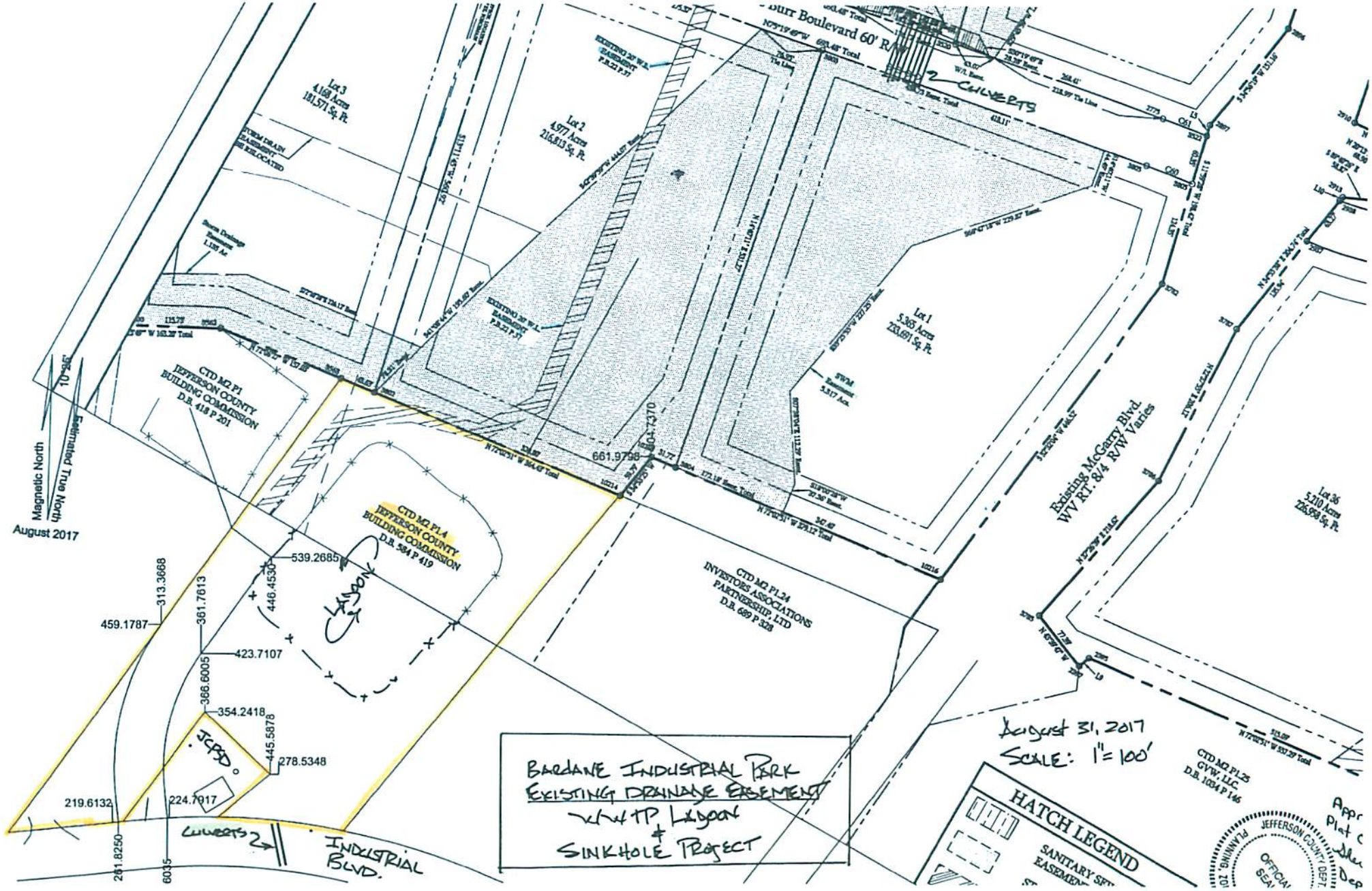
FIGURE 2

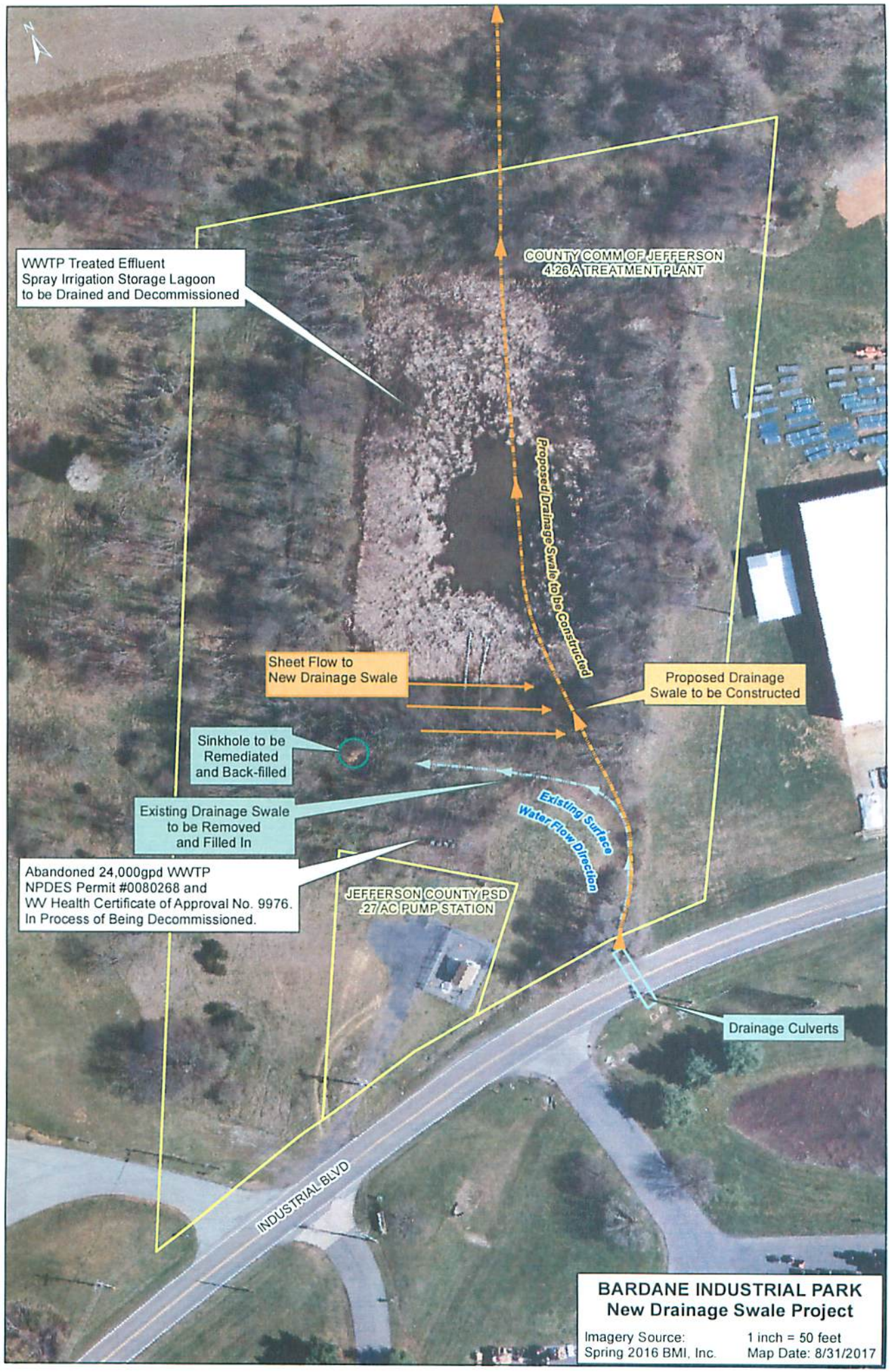


SINKHOLE MITIGATION

(DRAINAGE AREA 5 TO 15 ACRES)


Bardane Industrial Park - Jefferson County, WV
WWTP Location Map
Berkeley Co., WV
Washington Co., MD
Bardane
Clarke Co., VA
Loudoun Co., VA
To Martinsburg ~ 10 miles NW
To Charles Town ~ 6 Miles South
WILTSHIRE RD
USDA Appalachian Fruit Research
US Coast Guard
Nortom
CLENDENING DR
STEELEY WAY
W BURR BLVD
WAR ADMIRAL BLVD
ROUTE 9
CHARLES TOWN RD
LUTHER JONES RD
Advance Ryneal Medical Transport
Asphalt and Iron Musket Crossfit
Technologies
Allied Defense Ind.
COMMERCE CIR
Automated Merchandising Systems
RULAND RD
WV DMV
Shenandoah AC & Heating
Floor Mechanics
Valley Health
Kubic Construction
EDMOND RD
Todd Electric Shamrock Lighting
E BURR BLVD
B&M Painting
Flip & Cheer
Schonstedt Instruments
PETER BURR ST
Schwan's Sales Enterprises
CARS
T.A. Lowery Elementary School
INDUSTRIAL BLVD
Jefferson Co. 911 Center
Jefferson Co. Sheriff's Office
Jefferson Co. Maintenance Dept.
DALB
Jefferson County Public Services Center
Jefferson County Development Authority Offices
Dan McGinn
JAMES BURR BLVD
MCGARRY BLVD
Hollywood Casino
Avalanche Printing
Apple Valley Waste
R&L andscaping
Children First
Gingerbread Cottage Cour Candle
Jefferson Rentals
CHILDRENS WAY
TERRY MARCUS CT
JUI
WV State Police
USA Parts
Snyder Environmental/ Jefferson Utilities
JCC WWTP
PSD Pump Station
Randox
Royal Vendors
Jefferson County Board of Education
Universal Forest Products
Mountain State Machine Tool
SNAKE CREEK CT
DUNCAN FIELD LN
Aerial Image Source:
Blue Mountain Inc (Spring 2016)
200 100 0 200 400 600 800 1,000
Feet


Burr Boulevard 60' R/
2 CULVERTS
Lot 3
4.168 Acres
181,571 Sq. Ft.
Lot 2
4.977 Acres
216,813 Sq. Ft.
Lot 1
5.363 Acres
233,591 Sq. Ft.
Lot 36
5.210 Acres
226,958 Sq. Ft.
CTD M2 P1
JEFFERSON COUNTY
BUILDING COMMISSION
D.B. 418 P 201
CTD M2 P1A
JEFFERSON COUNTY
BUILDING COMMISSION
D.B. 584 P 419
CTD M2 P1.24
INVESTORS ASSOCIATIONS
PARTNERSHIP, LTD
D.B. 689 P 328
CTD M2 P1.25
GVW, LLC.
D.B. 1034 P 146
Existing McGarry Blvd.
WV RT. 8/4 R/W Varies
661.9798
804.7370
539.2685
446.4530
459.1787
313.3668
361.7613
423.7107
366.6005
354.2418
445.5878
278.5348
219.6132
224.7917
261.8250
6035
JCPSD
INDUSTRIAL BLVD.
Magnetic North
Estimated True North
August 2017
August 31, 2017
SCALE: 1" = 100'
BARDANE INDUSTRIAL PARK
EXISTING DRAINAGE EASEMENT
WWTP LAGOON
&
SINKHOLE PROJECT
HATCH LEGEND
SANITARY SEWER EASEMENT
JEFFERSON COUNTY DEPT. OF PLANNING
OFFICIAL SEAL


N
WWTP Treated Effluent
Spray Irrigation Storage Lagoon
to be Drained and Decommissioned
COUNTY COMM OF JEFFERSON
4.26 A TREATMENT PLANT
Proposed Drainage Swale to be Constructed
Sheet Flow to
New Drainage Swale
Proposed Drainage
Swale to be Constructed
Sinkhole to be
Remediated
and Back-filled
Existing Drainage Swale
to be Removed
and Filled In
Existing Surface
Water Flow Direction
Abandoned 24,000gpd WWTP
NPDES Permit #0080268 and
WV Health Certificate of Approval No. 9976.
In Process of Being Decommissioned.
JEFFERSON COUNTY PSD
.27 AC PUMP STATION
Drainage Culverts
INDUSTRIAL BLVD
BARDANE INDUSTRIAL PARK
New Drainage Swale Project
Imagery Source:
Spring 2016 BMI, Inc.
1 inch = 50 feet
Map Date: 8/31/2017

Bailey, Brian D

From:	Roger Goodwin <rgoodwin@jeffersoncountywv.org>
Sent:	Thursday, August 31, 2017 3:18 PM
To:	Anderson, Connie J
Cc:	Perkins, John M; Bailey, Brian D; Stephanie Grove; 'John Reisenweber (John@jcda.net)'; Bill Polk; Joe Kent; Jonathan Saunders; Roger Goodwin
Subject:	Jefferson County Bardane Industrial Park - WWTP Lagoon Decommission & Sinkhole Remediation Plan
Attachments:	2017-08-31 WVDEP - WWTP Lagoon Decommission & Sinkhole Remediation Plan - Merged Docs.pdf; 2017-08-29 WVDEP Email - Jefferson County Bus Garage Floor Drains.pdf

August 31, 2017

West Virginia Department of Environmental Protection
Division of Water and Waste Management
601 57th Street SE
Charleston, WV 25304

Attn: Ms. Connie Anderson, Environnemental Resources Program Manager

Re: Bardane Industrial Park UIC Rule Authorization
WWTP Lagoon Decommissioning & Sinkhole Remediation Plan

Dear Connie,

This email letter is in response to your August 10th letter outlining steps that must be taken by the Jefferson County Board of Education, at their school bus garage located in the Bardane Industrial Park, before our request for a time extension on the Jefferson County Commission's "UIC Rule Authorization" can be considered and approved.

Based the information provided by Dr. Bondy Shay Gibson, school superintendent, in the attached August 29th email, it appears that the school board is quickly moving in the direction of addressing the issues and concerns raised in your letter about the new school bus garage.

Therefore, I am going ahead and submitting the attached plan for the decommissioning the waste water treatment plant effluent discharge storage lagoon, and for remediation of the sinkhole, for your review and consideration. I've also copied John Perkins and Brian Bailey for their review and approval of the part of the plan to decommission the lagoon.

In addition, I will be submitting to the county commission, on September 21st for their approval, a request for proposals (RFP) to obtain the engineering consulting services needed to produce the construction documents for this project. However, we will hold off on advertising the RFP until we have received approval of our plan.

I met with Bill Polk, maintenance department director, on Tuesday, August 29th to discuss where to cut an access path to the lagoon so we can get a boat onto the lagoon to obtain the lagoon sludge/soil sample for testing, as discussed in the attached plan. We have already coordinated with

HydroChem/Mountain Research LLC lab services to perform the testing once we deliver the sample to them.

On another related matter, the maintenance director will soon be capping the two WWTP discharge pipes that run to the lagoon. Once this is done I will schedule a final inspection of the WWTP decommissioning work.

Please let me know if you have any questions or concerns with the proposed plan and if a time extension will be granted on the rule authorization that expires on October 1st.

Sincerely,

Roger Goodwin, PE, CFM
Director & Chief County Engineer
Jefferson County Department of Engineering, Planning & Zoning
P.O. Box 716
116 East Washington Street, Suite 100
Charles Town, WV 25414

304-728-3257
Engineering@jeffersoncountywv.org

MOUNTAIN RESEARCH, LLC

Corporate Office and Laboratory
825 25th Street
Altoona, PA 16601
814.949.2034 Phone
800.837.4674 Toll Free
814.949.9591 Fax

DuBois Office and Laboratory
110 McCracken Run Road
DuBois, PA 15801
814.371.6030 Phone
814.375.0823 Fax

Hydrochem Laboratories
85 Potomac Avenue
Shenandoah Junction, WV 25442
(304) 930-1972
Fax (304) 930-1975

Joseph W. Kent
Jefferson County Commission
116 E. Washington St. Suite 100, P.O. Box 716
Charles Town, WV 25414

02 October 2017

Lab ID #: 7090422

RE: Abandoned WWTP

Enclosed are the results of analyses for samples received by the laboratory on 09/19/17 08:27. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amanda Dutko
Laboratory Director

Authorized Reviewer

CLIENT NAME JEFFERSON COUNTY COMMISSION

CLIENT ADDRESS PO BOX 716, CHARLES TOWN WV 25414

Phone# 304-728-3257 MR PROJ # 9034.17.01

SITE LOCATION BARDANE EFFLUENT LAGOON

SAMPLER Joseph W. Kerr

NOTES:

Received On Ice: (Y) / N

Sample Temp: _____

PWSID #: _____

Comments: _____

HYDROCHEM LABORATORIES (A Division of Mountain Research, LLC)

85 Potomac Avenue, Shenandoah Junction, WV 25442 (304) 930-1972 Fax (304) 930-1975

825 25th Street, Altoona, PA 16601 (814) 949-2034 Fax (814) 949-9591

110 McCracken Run Road, Dubois, PA 15801 (814) 371-6030 Fax (814) 375-0823

CHAIN OF CUSTODY RECORD

MR PROJ. MGR. A. Dutko

Shipping Carrier: _____

Turn Around Time:
10 Day __x_____
3 Day _____
1 Day _____

Comments:

SAMPLE ID	DATE	TIME	GRAB	COMP	MATRIX	Type of Container	NUMBER OF CONTAINERS	As, Cd, Cr, Cu, Pb, Mo, Ni, Se, Zn, P, K, Ca, Mg	Hg	Cyanide	Total N	ph	Percent Solids	Fecal Coliform	Volitile Solids			Preserve	LAB NUMBER
EFFLUENT LAGOON SLUDGE/SOIL	09/19/17	8:09	x		SLUDGE Solid	AMBER GLASS 1 L	1	✓	✓	✓	✓	✓	✓	✓	✓		10.5%	none	01

709042 2 L

RELINQUISHED BY:	DATE	TIME	ACCEPTED BY:	DATE/TIME	Lab Workorder #:	Log In Time:
	09/19/17	8:27	Bob Harms	9/19/2017 0827	7090422	0859
RELINQUISHED BY:	DATE	TIME	ACCEPTED BY:	DATE/TIME	Labeled By:	Staff: BAH
						Date: 9-19-2017

MOUNTAIN RESEARCH SAMPLE RECEIPT PROTOCOL

WORK ORDER: 7090422

CLIENT: Jefferson County Commission

DATE SAMPLED: 9-19-2017 DATE RECEIVED: 9-19-2017 TIME RECEIVED: 0827

1. CHECK ALL THAT APPLY: PA ☐ WV ☑ MD ☐ PWS ☐ NPDES/COMPLIANCE ☐ DAIRY ☐ RUSH ☐

2. WERE ANY OF THE SAMPLE CONTAINERS DAMAGED/LEAKING? (ARE CUSTODY SEALS BROKEN?) YES ☐ NO ☑

IF YES, EXPLAIN: _____

3. NUMBER OF CONTAINERS RECEIVED: 1

4. WERE THE SAMPLES RECEIVED ON ICE/OTHER ACCEPTABLE REFRIGERANT? YES ☑ NO ☐

IF NO, EXPLAIN: _____

5. RECEIVING TEMP: 10.5 °C TEMP CONTROL(S) PRESENT YES ☐ NO ☑ BOTTLE(S) TEMPED: 1

6. WERE THE SAMPLES PROPERLY PRESERVED? YES ☑ NO ☐

IF NO, EXPLAIN: _____

7. WERE THE SAMPLES COLLECTED IN THE CORRECT CONTAINERS? YES ☑ NO ☐

IF NO, EXPLAIN: _____

8. IS THERE HEADSPACE PRESENT FOR VOLATILES/ODOR SAMPLES? YES ☐ NO ☐ N/A ☑

9. WAS THE COC FILLED OUT PROPERLY? YES ☑ NO ☐

IF NO, EXPLAIN: _____

10. DID THE SAMPLE LABEL(S) CONTAIN ADEQUATE INFO? (CLIENT/DATE/TIME/PRESERVATIVE) YES ☑ NO ☐

IF NO, EXPLAIN: _____

11. WERE ANY OF THE SAMPLES RECEIVED OUTSIDE OF HOLDING TIME? YES ☑ NO ☐

IF YES, EXPLAIN: _____

12. DO THE SAMPLES REQUIRE ANALYSES THAT HAVE A SHORT HOLDING TIME? YES ☑ NO ☑

IF YES, WHAT ANALYSES? Fecal Coliform 24 hrs PLEASE NOTIFY LABORATORY ANALYSTS!

13. IS SUBCONTRACTING REQUIRED? YES ☑ NO ☐

IF YES, WHAT ANALYSES? all - sludge matrix REI Consultants Inc.

14. WAS THE CLIENT CONTACTED? YES ☐ NO ☑ IF YES, FILL OUT THE FOLLOWING:

MR EMPLOYEE INITIALS: _____ CLIENT SPOKEN TO: _____ DATE/TIME: _____

OUTCOME: _____

SIGNATURE: BA Harms

L60.30.A r2 Sample Receipt Form

For MR Use Only

REIC

Improving the environment, one client at a time...

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

3029-C Peters Creek Road
Roanoke, VA 24019
TEL: 540.777.1276

1557 Commerce Road, Suite 201
Verona, VA 24482
TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Thursday, September 28, 2017

MS. BARBARA HARMS
HYDROCHEM LABORATORIES, INC
P O BOX 400
SHENANDOAH JUNCTION, WV 25442

TEL: (304) 930-1972
FAX: (304) 725-7932

RE: 7090422

Work Order #: 17092374

Dear MS. BARBARA HARMS:

REI Consultants, Inc. received 1 sample(s) on 9/19/2017 for the analyses presented in the following report.

Sincerely,

Bobby Adams

Bobby Adams
Project Manager
(304) 250-6218

REI Consultants, Inc. - Case Narrative

WO#: 17092374

Date Reported: 9/28/2017
Original

Client: HYDROCHEM LABORATORIES, INC

Project: 7090422

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP and/or VELAP requirements for parameters clearly designated as PA, VA, PA/VA, or VELAP in the column labeled NELAP.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

DEFINITIONS:
MCL: Maximum Contaminant Level
MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
NA: Not Applicable
ND: Not Detected at the PQL or MDL
PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
Qual: Qualifier that applies to the analyte reported.
TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: Analyte concentration reported that exceeds the upper calibration standard. Greater uncertainty is associated with this result and data should be considered estimated.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, NCDWQ 466, PADEP 68-00839, VADCLS(VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 17092374

Date Reported: 9/28/2017
Original

Client:	HYDROCHEM LABORATORIES, INC	**Collection Date:**	9/19/2017 8:09:00 AM
Project:	7090422	**Date Received:**	9/19/2017
Lab ID:	17092374-01A	**Matrix:**	Solid
Client Sample ID:	7090422-01	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
METALS by ICP			**Method: SW6010C**				**Analyst: DL**	
Arsenic	10.7	2.00	5.00	NA		mg/Kg-dry	9/21/2017 5:17 PM	PA/VA
Cadmium	ND	0.200	1.00	NA		mg/Kg-dry	9/21/2017 5:17 PM	PA/VA
Calcium	1,980	10.0	50.0	NA		mg/Kg-dry	9/21/2017 5:17 PM	PA/VA
Chromium	48.9	0.500	5.00	NA		mg/Kg-dry	9/21/2017 5:17 PM	PA/VA
Copper	24.3	0.500	5.00	NA		mg/Kg-dry	9/21/2017 5:17 PM	PA/VA
Lead	23.4	1.00	5.00	NA		mg/Kg-dry	9/21/2017 5:17 PM	PA/VA
Magnesium	558	5.00	25.0	NA		mg/Kg-dry	9/21/2017 5:17 PM	PA/VA
Molybdenum	1.58	1.00	5.00	NA	J	mg/Kg-dry	9/21/2017 5:17 PM	PA/VA
Nickel	16.9	0.500	5.00	NA		mg/Kg-dry	9/21/2017 5:17 PM	PA/VA
Phosphorus	548	5.00	25.0	NA		mg/Kg-dry	9/21/2017 5:17 PM	PA/VA
Potassium	1,410	5.00	25.0	NA		mg/Kg-dry	9/21/2017 5:17 PM	PA/VA
Selenium	ND	3.00	5.00	NA		mg/Kg-dry	9/21/2017 5:17 PM	PA/VA
Zinc	41.5	0.500	5.00	NA		mg/Kg-dry	9/21/2017 5:17 PM	PA/VA
MERCURY, Total SW7471B			**Method: SW7471B**				**Analyst: JH**	
Mercury	0.079	0.004	0.020	NA		mg/Kg-dry	9/26/2017 10:37 AM	PA/VA
FECAL COLIFORM BY MEMBRANE FILTER:			**Method: SM9222 D-1997**				**Analyst: BD**	
Fecal Coliform	ND	1,000	1,000	NA		col/gram dry-wt	9/20/2017 8:08 AM	
SOLIDS, Total			**Method: SM2540 G-1997**				**Analyst: SF**	
Total Solids	29.4	NA	0.01	NA		wt%	9/20/2017 10:24 AM	
TOTAL VOLATILE SOLIDS			**Method: SM2540 G-1997**				**Analyst: SF**	
Total Volatile Solids	15.1	NA	0.01	NA		wt%	9/20/2017 10:27 AM	PA/VA
TOTAL NITROGEN			**Method: EPA 351.2 / SW9056**				**Analyst: CC**	
Nitrogen, Total as N	1,180	2.38	3.40	NA		mg/Kg-dry	9/28/2017 8:20 AM	
CYANIDE			**Method: SW9010B/9012B**				**Analyst: EA**	
Cyanide, Total	ND	0.250	1.00	NA		mg/Kg	9/21/2017 1:27 PM	
pH - LAB TEST			**Method: SW9045D**				**Analyst: VS**	
pH	5.84	NA	NA	NA		SU	9/25/2017 10:15 AM	PA/VA

REIC
Improving the environment, one client at a time...

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304)255-2500
Website: www.reiclabs.com

Sample Receipt Checklist

Client Name:	HYD003			Work Order Number:	17092374
RCPNo:	1	Date and Time Received:	9/19/2017 7:21:42 PM	Received by:	Robert Gilligan
Completed By:	Justin Harrah		Reviewed By:	Bobby Adams	
Completed Date:	9/19/2017 7:23:00 PM		Reviewed Date:	9/20/2017 9:11 AM	

Carrier Name: REIC

1.	Chain of custody present?	Yes [x]	No [ ]	
2.	Chain of custody signed when relinquished and received?	Yes [x]	No [ ]	
3.	Are matrices correctly identified on Chain of custody?	Yes [x]	No [ ]	
4.	Is it clear what analyses were requested?	Yes [x]	No [ ]	
5.	Custody seals intact?	Yes [ ]	No [ ]	Not Present [x]
6.	Samples in proper container type and preservative?	Yes [x]	No [ ]	
7.	Were correct preservatives noted on COC?	Yes [x]	No [ ]	NA [ ]
8.	Sample containers intact?	Yes [x]	No [ ]	
9.	Sufficient sample volume for indicated test?	Yes [x]	No [ ]	
10.	Were container labels complete?	Yes [x]	No [ ]	
11.	All samples received within holding time?	Yes [x]	No [ ]	
12.	Was an attempt made to cool the samples?	Yes [x]	No [ ]	NA [ ]
13.	Sample Temp. taken and recorded upon receipt?	Yes [x]	No [ ]	To 0 °C
14.	Water - Were bubbles absent in VOC vials?	Yes [ ]	No [ ]	No Vials [x]
15.	Are Samples considered acceptable?	Yes [x]	No [ ]	
16.	COC filled out properly?	Yes [x]	No [ ]	

Client Notification/Response

Client Name:	HYD003					Work Order Number:	17092374	
Comment:								
Client Contacted:	Yes [ ]	No [ ]	NA [x]	Person Contacted:				
Contact Mode:	Phone [ ]	Fax: [ ]	Email: [ ]	In Person: [ ]				
Date Contacted:				Contacted By:				
Regarding:								
Client Instructions:								
Corrective Action:								

SUBCONTRACT ORDER

Mountain Research, LLC

7090422

Proj 9034.17.01 09192017-HC-01

SENDING LABORATORY:

Hydrochem, A Division of Mountain Research
85 Potomac Avenue
Shenandoah Junction, WV
Phone: (304) 930-1972
Faxx: (304) 930-1975

Project Manager: Amanda Dutko

RECEIVING LABORATORY:

REI Consultants, Inc
225 Industrial Blvd
Beaver, WV 25813
Phone :(304) 255-2500
Fax:

17092374
HYDROCHEM LABORATORIES, INC
HYD003
Bobby Adams

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: 7090422-01	**Solid**	**Sampled:09/19/17 08:09**	BARDANE Effluent Lagoon	
W-Subcontract	10/03/17 16:00	10/03/17 08:09		*Metals, Hg,Cn, Total N, pH, %Solids, Fecal Coli., Volatile Solids

Containers Supplied:

* Metals (As, Cd, Cr, Cu, Pb, Mo, Ni, Se, Zn, P, K, Ca, Mg)

0.0° Corrected IR#1

Delivery: REI Client Other
Containers: REI Client
Custody Seals: Y N

Released By — Date 9/19/17 — Received By — Date 9.19.17 0950

Released By — Date 9-19-17 2:20 — Received By — Date 9/19/17 1605

9/19/17 1600

Bailey, Brian D

From: Roger Goodwin <rgoodwin@jeffersoncountywv.org>
Sent: Tuesday, October 03, 2017 10:06 AM
To: Bailey, Brian D
Cc: Perkins, John M; Anderson, Connie J; Joe Kent; Bill Polk; Roger Goodwin
Subject: RE: Jefferson County Bardane Industrial Park - WWTP Lagoon Decommission & Sinkhole Remediation Plan
Attachments: 2017-10-02 Bardane Industrial Park WWTP Lagoon Sludge-Soil Lab Test Results.pdf

October 3, 2017

Brian, John & Connie,

In response to the chain of emails below, please find attached the Bardane Industrial Park WWTP Lagoon sludge/soil lab test results, as requested. We are required to submit these as part of your consideration of our plan to remediate the sinkhole and decommission the lagoon.

Please contact me if you have any questions.

Roger Goodwin, PE, CFM
Director & Chief County Engineer
Jefferson County Department of Engineering, Planning & Zoning
P.O. Box 716
116 East Washington Street, Suite 100
Charles Town, WV 25414

304-728-3257
Engineering@jeffersoncountywv.org

From: Bailey, Brian D [mailto:Brian.D.Bailey@wv.gov]
Sent: Tuesday, September 12, 2017 8:03 AM
To: Roger Goodwin
Cc: Perkins, John M; Joe Kent; Bill Polk; Anderson, Connie J
Subject: RE: Jefferson County Bardane Industrial Park - WWTP Lagoon Decommission & Sinkhole Remediation Plan

Ok, thanks.

When we receive the test results, we can move forward.

BB

From: Roger Goodwin [mailto:rgoodwin@jeffersoncountywv.org]
Sent: Monday, September 11, 2017 10:10 AM
To: Bailey, Brian D <Brian.D.Bailey@wv.gov>
Cc: Perkins, John M <John.M.Perkins@wv.gov>; Roger Goodwin <rgoodwin@jeffersoncountywv.org>; Joe Kent <jkent@jeffersoncountywv.org>; Bill Polk <bpolk@jeffersoncountywv.org>
Subject: RE: Jefferson County Bardane Industrial Park - WWTP Lagoon Decommission & Sinkhole Remediation Plan

September 11, 2017

Brian,

I was out of the office last Friday. No, we did not submit the lagoon sludge/soil test results with the decommissioning plan. Our maintenance department is working on cutting an access point to the lagoon so we can put a boat on it to collect the sample. A few days of rain has caused a delay, but we hope to get the sample and have it tested soon.

Roger Goodwin, PE, CFM
Director & Chief County Engineer
Jefferson County Department of Engineering, Planning & Zoning
P.O. Box 716
116 East Washington Street, Suite 100
Charles Town, WV 25414

304-728-3257
Engineering@jeffersoncountywv.org

From: Bailey, Brian D [mailto:Brian.D.Bailey@wv.gov]
Sent: Friday, September 08, 2017 9:40 AM
To: Roger Goodwin
Cc: Perkins, John M
Subject: RE: Jefferson County Bardane Industrial Park - WWTP Lagoon Decommission & Sinkhole Remediation Plan

Roger,
Did you forward those soil/sludge test results to us? I didn't see them in this plan.

Thanks,
BB

From: Roger Goodwin [mailto:rgoodwin@jeffersoncountywv.org]
Sent: Thursday, August 31, 2017 3:18 PM
To: Anderson, Connie J <Connie.J.Anderson@wv.gov>
Cc: Perkins, John M <John.M.Perkins@wv.gov>; Bailey, Brian D <Brian.D.Bailey@wv.gov>; Stephanie Grove <sgrove@jeffersoncountywv.org>; 'John Reisenweber (John@jcda.net)' <John@jcda.net>; Bill Polk <bpolk@jeffersoncountywv.org>; Joe Kent <jkent@jeffersoncountywv.org>; Jonathan Saunders <jsaunders@jeffersoncountywv.org>; Roger Goodwin <rgoodwin@jeffersoncountywv.org>
Subject: Jefferson County Bardane Industrial Park - WWTP Lagoon Decommission & Sinkhole Remediation Plan

August 31, 2017

West Virginia Department of Environmental Protection
Division of Water and Waste Management
601 57th Street SE
Charleston, WV 25304

Attn: Ms. Connie Anderson, Environnemental Resources Program Manager

Re: Bardane Industrial Park UIC Rule Authorization
WWTP Lagoon Decommissioning & Sinkhole Remediation Plan

Dear Connie,

This email letter is in response to your August 10th letter outlining steps that must be taken by the Jefferson County Board of Education, at their school bus garage located in the Bardane Industrial Park, before our request for a time extension on the Jefferson County Commission's "UIC Rule Authorization" can be considered and approved.

Based the information provided by Dr. Bondy Shay Gibson, school superintendent, in the attached August 29th email, it appears that the school board is quickly moving in the direction of addressing the issues and concerns raised in your letter about the new school bus garage.

Therefore, I am going ahead and submitting the attached plan for the decommissioning the waste water treatment plant effluent discharge storage lagoon, and for remediation of the sinkhole, for your review and consideration. I've also copied John Perkins and Brian Bailey for their review and approval of the part of the plan to decommission the lagoon.

In addition, I will be submitting to the county commission, on September 21st for their approval, a request for proposals (RFP) to obtain the engineering consulting services needed to produce the construction documents for this project. However, we will hold off on advertising the RFP until we have received approval of our plan.

I met with Bill Polk, maintenance department director, on Tuesday, August 29th to discuss where to cut an access path to the lagoon so we can get a boat onto the lagoon to obtain the lagoon sludge/soil sample for testing, as discussed in the attached plan. We have already coordinated with HydroChem/Mountain Research LLC lab services to perform the testing once we deliver the sample to them.

On another related matter, the maintenance director will soon be capping the two WWTP discharge pipes that run to the lagoon. Once this is done I will schedule a final inspection of the WWTP decommissioning work.

Please let me know if you have any questions or concerns with the proposed plan and if a time extension will be granted on the rule authorization that expires on October 1st.

Sincerely,

Roger Goodwin, PE, CFM
Director & Chief County Engineer
Jefferson County Department of Engineering, Planning & Zoning
P.O. Box 716
116 East Washington Street, Suite 100
Charles Town, WV 25414

304-728-3257
Engineering@jeffersoncountywv.org