



Stantec Consulting Services Inc.  
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December 22, 2022  
File: U:\173409619\regulatory\Variance Request

**Attention: Greg Fedner, P.E.**  
Section Manager, Plan Review Section  
City of Columbus  
Division of Sewerage and Drainage  
1250 Fairwood Avenue  
Columbus, OH 43206

Transmitted via email to: [GFedner@columbus.gov](mailto:GFedner@columbus.gov)

Dear Mr. Fedner,

**Reference: City of Columbus Stormwater Drainage Manual (SWDM): Type III Stream Corridor Protection Zone (SCPZ) Variance Request For Proposed Parsons Avenue Residuals Disposal Improvements 5911 Lockbourne Road, Lockbourne, Ohio 43137, CIP No. 690579-100000**

On behalf of the City of Columbus, Division of Water (DOW), Stantec is submitting this application for Type III Stream Corridor Protection Variance Request from the City of Columbus Stormwater Drainage Manual Section 1.3.3 Prohibited Uses in the Stream Corridor Protection Zone for excavation, placement of fill and fence, installation of structure, change in topography, and removal of native trees for the Proposed Parsons Avenue Residuals Disposal Improvements project at the Lockbourne Road Quarry (LRQ).

Use of the LRQ as a water treatment residuals disposal site is critical to the long-term ability of Columbus DOW to treat water in a cost-effective manner. Installation of a series of force mains and flow control structures, and ground improvements to ensure the stability of the quarry, are essential to the project.

Per the delineation of the current effective FEMA floodway, much of the project site is located within the SCPZ. Some of the proposed improvements, and their associated disturbances, will therefore be within the SCPZ. Alternative configurations and layouts which completely avoid the SCPZ are not available given the orientation of the SCPZ across the site. Hydraulic and Hydrologic (H&H) analysis of the site has established that the current FEMA effective floodplain is outdated and will likely see significant updates in the area of the LRQ in the next map update, which is currently undergoing revision through FEMA's Upper Scioto Watershed Study. Modeling and preliminary FIRM maps show that the SCPZ extents would be significantly reduced and thus the real impacts of the proposed work are anticipated to be much less than those reflected in this variance request. However, this variance request is being submitted based upon the currently mapped effective FEMA floodway orientation.

Approval of a Type III SWDM variance is sought for the construction of a water treatment residuals disposal facility with elements within the SCPZ of the Big Walnut Creek for the proposed Preferred Alternative. Without an approved variance, this facility cannot be constructed at the LRQ.

**Reference:** City of Columbus Stormwater Drainage Manual (SWDM): Type III Stream Corridor Protection Zone (SCPZ) Variance Request For Proposed Parsons Avenue Residuals Disposal Improvements 5911 Lockbourne Road, Lockbourne, Ohio 43137, CIP No. 690579-100000

Two alternatives for improvements were considered. The Preferred Alternative minimizes disturbances within the future anticipated SCPZ while providing the most cost-effective option for DOW. The Minimal Impact Alternative adjusts or relocates proposed improvements where feasible to minimize disturbances throughout the current SCPZ, incurring additional capital and operating cost to the DOW. Appropriate SCPZ mitigation measures will be provided on-site for the full extent of disturbances within the current SCPZ for either alternative to meet SWDM Section 1.3 requirements.

The only Full Compliance Alternative is to not construct the project. If the City is not able to construct the project, the DOW will be operating with a major risk to its ability to continue to meet its water supply obligations to its customers. If the DOW cannot find offsite options to dispose of water treatment residuals, it will have to shut down and the cost implications are incalculable at this time. This existential threat led the City to undertake the recently completed Residuals Management Plan Update which concluded that residual disposal at LRQ in addition to existing third-party offsite beneficial use provides the City with multiple outlets to sustain the functioning of the PAWP.

Approving a Type III SWDM variance for the Preferred Alternative is therefore critical to the ability of the City of Columbus and DOW to treat water in a cost-effective and sustainable manner to fulfill its obligations to its customers.

Additional information pertaining to the requested variance is included. If you have any questions, please contact us at the undersigned. Thank you.

Regards,

**Stantec Consulting Services Inc.**

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**PAWP RESIDUALS DISPOSAL  
IMPROVEMENTS  
TYPE III STREAM CORRIDOR  
PROTECTION ZONE VARIANCE REQUEST**

December 22, 2022

Prepared for:  
City of Columbus Division of Water

Prepared by:  
Stantec Consulting Services, Inc.

Project Number:  
CIP No. 690579-100000

## Type III Stream Corridor Protection Zone Variance Request

<b>Revision</b>	<b>Description</b>	<b>Author</b>	<b>Date</b>	<b>Quality Check</b>	<b>Date</b>	<b>Independent Review</b>	<b>Date</b>



## Type III Stream Corridor Protection Zone Variance Request

The conclusions in the Report titled PAWP Residuals Disposal Improvements Type III Stream Corridor Protection Zone Variance Request are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from City of Columbus Division of Water (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided to applicable authorities having jurisdiction and others for whom the Client is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.

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## Table of Contents

<b>ACRONYMS / ABBREVIATIONS.....</b>	<b>II</b>
<b>1 REASON FOR VARIANCE REQUEST.....</b>	<b>1-1</b>
1.1 Project Description .....	1-1
1.2 Previous Analyses .....	1-3
1.2.1 Floodplain Regulations .....	1-3
1.2.2 Ohio EPA NPDES Outfall .....	1-3
1.2.3 USACE Section 404 Permit and Ohio EPA Section 401 and Wetland and Ephemeral Stream Permits.....	1-4
1.3 Type of Variance Requested.....	1-5
1.4 Affected Stream Resources and SCPZ Delineation.....	1-5
1.4.1 100-Year Floodway .....	1-6
1.4.2 Drainage Area Equation .....	1-6
1.4.3 50 Feet from Top of Bank.....	1-7
1.4.4 Considerations for Big Darby Creek and Olentangy River Watersheds .....	1-7
1.4.5 Results.....	1-7
1.5 Proposed SCPZ Impacts.....	1-9
1.6 Permitted Uses in the SCPZ .....	1-10
1.7 Statement of Hardship.....	1-10
<b>2 PROJECT ALTERNATIVES.....</b>	<b>2-1</b>
2.1 Preferred Alternative.....	2-1
2.2 Minimal Impact Alternative .....	2-4
2.3 Full Compliance Alternative.....	2-6
<b>3 MITIGATION.....</b>	<b>3-1</b>
3.1 Mitigation Requirements.....	3-1
3.2 Proposed Mitigation for SCPZ Impacts .....	3-1
<b>4 CONCLUSION.....</b>	<b>4-1</b>

### LIST OF TABLES

Table 1: Parcel Summary Information .....	1-2
Table 2: Summary of Preferred Alternative Activities and Disturbance Area .....	2-1
Table 3: Summary of Minimal Impact Alternative Activities and Disturbance Area .....	2-4

### LIST OF FIGURES

Figure 1: LRQ Site Map .....	1-2
Figure 2: SCPZ Delineation .....	1-8
Figure 3: SCPZ Preferred Alternative .....	2-3
Figure 4: SCPZ Minimal Impact Alternative .....	2-5



## Acronyms / Abbreviations

AJD	Approved Jurisdictional Determination
CFS	Cubic feet per second
DOSD	Division of Sewerage and Drainage
DOW	Division of Water
DSW	Division of Surface Water
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
H&H	Hydrologic and hydraulic
HDD	Horizontal Directional Drilling
HUC	Hydrologic Unit Code
LRQ	Lockbourne Road Quarry
MAQ	McKinley Avenue Quarry
MGD	Million gallons per day
NLS	National Lime and Stone
NPDES	National Pollutant Discharge Elimination System
Ohio EPA	Ohio Environmental Protection Agency
OHWM	Ordinary High-Water Mark
PAWP	Parsons Avenue Water Plant
PTI	Permit to Install
SCPZ	Stream Corridor Protection Zone
SWDM	Stormwater Drainage Manual
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
WOUS	Water(s) of the United States



# **1 Reason For Variance Request**

A Type III variance is requested from the City of Columbus Stormwater Drainage Manual (SWDM) Section 1.3.3 Prohibited Uses in the Stream Corridor Protection Zone for excavation, placement of fill and fence, installation of structure, change in topography, and removal of native trees for the proposed Parsons Avenue Residuals Disposal Improvements project at the Lockbourne Road Quarry (LRQ).

## **1.1 Project Description**

The City of Columbus Parsons Avenue Water Plant (PAWP), located at 5600 Parsons Avenue, Lockbourne, Ohio 43137, is a 50 million gallons per day (MGD) ground water lime and soda ash softening plant supplied by six radial collector wells in southern Franklin County.

PAWP currently uses three on-site lagoons for storage of treatment residuals. Between 2010 and 2012, the lagoons reached maximum storage capacity, requiring the hauling of approximately 900,000 cubic yards of lime residuals to the McKinley Avenue Quarry (MAQ) at a cost of approximately \$10,000,000 (2012 dollars). The MAQ is currently the permanent residuals disposal site for the other two City-owned water plants and is located approximately 15 miles northwest of PAWP.

In 2018, the City purchased the Lockbourne Road Quarry (LRQ), located at 5911 Lockbourne Road, Lockbourne, Ohio 43137 (east of PAWP) for use as a permanent residuals disposal site to replace the lagoons as the primary location for residuals disposal. Advantages of the LRQ include:

1. An estimated 34 to 114 additional years of residuals disposal capacity for the PAWP, depending on plant source water characteristics, production rate, and chemical usage;
2. Reduction of disposal costs to remove existing residuals from the on-site lagoons; and
3. Elimination of environmental issues related to trucking the residuals (spillage, public perception, etc.)

The primary LRQ site owned by the City of Columbus Division of Water (DOW) consists of four (4) parcels totaling 370.11 acres of land. The site is bounded by Lockbourne Road on the east, London-Groveport Road on the south, and Big Walnut Creek to the north and west. Refer to Figure 1a for the LRQ site location relative to the PAWP and Big Walnut Creek. The land was previously used by National Lime and Stone (NLS) for sand and gravel mining operations until September 2018, when all the parcels were purchased by the DOW. A summary of the parcel information is provided in Table 1 and Figure 1b.

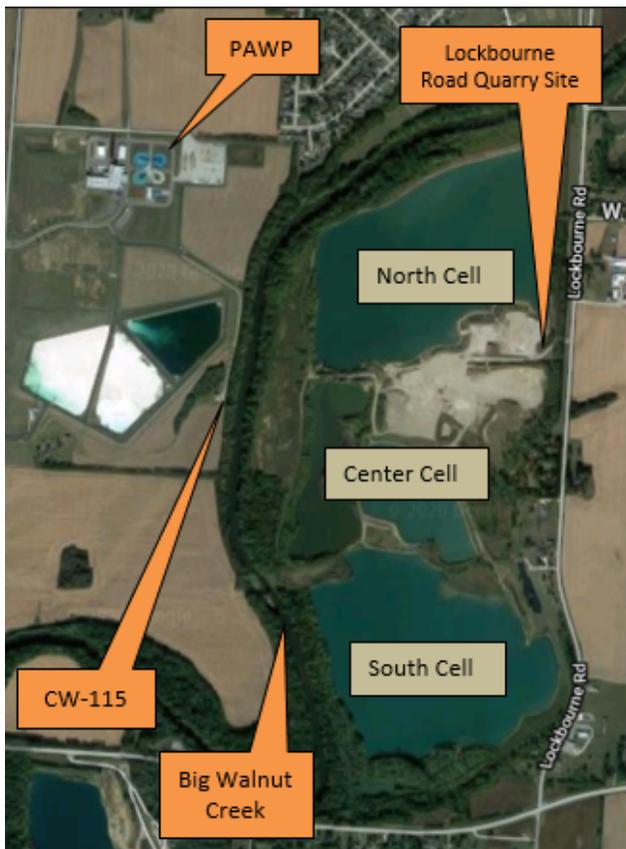


**Type III Stream Corridor Protection Zone Variance Request  
1 Reason For Variance Request**

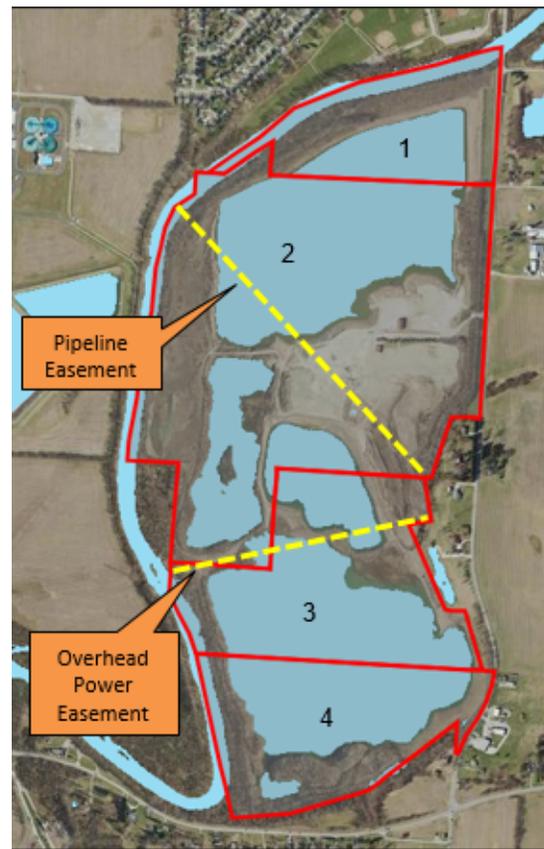
**Table 1: Parcel Summary Information**

Parcel #	Parcel ID*	Acreage*	Location	Land Usage
1	150-000411-00	41.736	North Property	Former sand and gravel quarry and embankment between Big Walnut Creek
2	150-000820-00	194.828	North Center Property	Former sand and gravel quarry and NLS operations buildings. Embankment between Big Walnut Creek.
3	150-000821-00	73.058	South Center Property	Former sand and gravel quarry. High tension power lines.
4	150-000683-00	60.488	South Property	Former sand and gravel quarry

\*Property information obtained from the Franklin County Auditor web site GIS mapping.



**a) Site Plan**



**b) Parcel Boundary Map with Easements**

**Figure 1: LRQ Site Map**

The mining activity created four (4) large pond areas referred to as the North, Center West, Center East, and South cells. The final topography of the site after the completion of mining activities includes narrow berms between each of the cells and the continuous in-situ earth berm to the north and west along Big



## **Type III Stream Corridor Protection Zone Variance Request**

### **1 Reason For Variance Request**

Walnut Creek. When water levels are high, the berm between the north and center cells may be submerged under a few feet of water. Emergency repairs to the North Cell northern wall are currently being performed after the berm failed during a wet weather event in Spring of 2022.

The project site is located within the Federal Emergency Management Agency's (FEMA's) effective floodplain and floodway. It is within the jurisdictional area of the Franklin County Floodplain Administrator; however, since the work is proposed by the City of Columbus Department of Public Utilities, it is also subject to Columbus' *Division of Sewerage and Drainage (DOSD) Stormwater Drainage Manual (May 2021)* (SWDM) requirements. Coordination is ongoing between all impacted regulators, as is described in more detail in Section 1.2.

The project is currently in the preliminary design stage. Construction activities proposed at this stage in the design are described in Section 1.5.

## **1.2 Previous Analyses**

### **1.2.1 FLOODPLAIN REGULATIONS**

Proposed construction activities, as described in Section 1.5, are expected to occur within FEMA's 1-percent-annual-chance floodplain and floodway. As such, a No-Rise Certification will be sought with the Franklin County and the City of Columbus Floodplain Administrators. In order to efficiently fund design efforts associated with this project, hydrologic and hydraulic (H&H) analyses were completed related to the preliminary design configuration. The H&H analyses at this stage were submitted to the affected regulatory agencies for initial review and comment, to ascertain whether the project would be permissible, should the future detailed design configuration not significantly change. The post construction condition model shows a No-Rise condition. The No-Rise condition is attributable to high ground around the quarry that causes ineffective flow area within the project area under existing conditions.

In April of 2022, Stantec, on behalf of DOW, submitted H&H analyses showing a No-Rise Condition as of the preliminary design stage to the Franklin County Floodplain Administrator. The County's response indicated that "the preferred alternatives could be permitted with a No-Rise Certification," should the project move forward in a manner consistent with the preliminary design configuration.

In June of 2022, the same H&H analyses, along with the results of Franklin County's preliminary review, were also submitted to the City of Columbus' Floodplain Administrator. The City of Columbus' Floodplain Administrator also indicated that if the project should move forward as proposed, a No-Rise analysis would be accepted.

It is understood that the preliminary buy-in obtained from the Floodplain Administrators is subject to the formal submittal of design documents and updated analyses upon the completion of detailed design.

### **1.2.2 OHIO EPA NPDES OUTFALL**

The proposed operational scenario for residuals disposal at the LRQ is to create a new National Pollutant Discharge Elimination System (NPDES) outfall to Big Walnut Creek allowing the discharge of decant



## **Type III Stream Corridor Protection Zone Variance Request**

### **1 Reason For Variance Request**

water using gravity and retention time in the LRQ to separate the lime and waste wash water residuals from the water plant wastewater stream. Ohio Environmental Protection Agency (Ohio EPA) Division of Surface Water (DSW) indicated during discussions leading up to the purchase of the LRQ site in a letter dated August 20, 2015 that this use is permissible as a wastewater treatment and disposal system, requiring submission of an NPDES permit modification request under the Ohio Antidegradation Rule, and a Permit to Install (PTI) application for residuals conveyance facilities to the LRQ and for an outfall from the LRQ to the Big Walnut Creek. As a wastewater treatment and disposal system, the LRQ facilities will be required to be operational in a 25-year flood event and protected against a 100-year flood event. This has been considered in the proposed placement of facilities for preliminary design purposes.

Further analysis was performed to demonstrate that the lime residuals and any associated contaminant would not leave the LRQ and migrate off site in the groundwater. A July 12, 2018, letter from Ohio EPA DSW indicated that the groundwater concerns mentioned in the August 2015 correspondence had been adequately addressed by the LRQ Analysis.

Additional communications undertaken in Preliminary Design included meetings with Ohio EPA DSW on February 19, 2021, and April 5, 2021, to discuss progress and confirm regulatory details toward an NPDES outfall application. The results of these interactions were summarized in a letter to Ohio EPA dated April 27, 2021. Ohio EPA DSW indicated that multiple outfalls could be permitted for the PAWP, requiring that to maintain the existing permitted outfall and install a new permitted outfall for the LRQ, an NPDES permit modification of the current Plant Permit and PTI would both be required. The Antidegradation Rule Review process would also be required, but the only parameters of interest would be pH and Total Suspended Solids (TSS). Ohio EPA DWS recommended that the NPDES permit modification be submitted first followed by the PTI application 4 months prior to bid advertisement.

### **1.2.3 USACE SECTION 404 PERMIT AND OHIO EPA SECTION 401 AND WETLAND AND EPHEMERAL STREAM PERMITS**

An Approved Jurisdictional Determination (AJD) was provided from the United States Army Corps of Engineers (USACE) to the DOW on August 26, 2021. Of nine (9) wetlands and two (2) streams identified on site, only the Big Walnut Creek was determined to be a Water of the United States (WOUS). No impact on the Big Walnut Creek below the ordinary high water mark (OHWM) is anticipated, including discharge of dredged or fill materials. A Section 404 Permit is not anticipated to be needed at this time.

The wetlands and stream not covered by USACE WOUS jurisdiction are subject to Ohio EPA DSW jurisdiction. Once the full extent of potential wetland impacts is determined, the appropriate permitting can be pursued. This may include Section 401 Water Quality Certification, Section 401 Director's Authorization, or an Isolated Wetland and Ephemeral Stream General Permit. Where feasible, impacts to wetlands and streams will be avoided to maintain the established quality of the existing wetlands on site. It is anticipated the necessary information for the submittal will be known to allow submittal at 60% design.



**Type III Stream Corridor Protection Zone Variance Request  
1 Reason For Variance Request**

### **1.3 Type of Variance Requested**

This project is proposed by Columbus DOW and is therefore subject to Columbus' SWDM regulations. The SWDM was reviewed, and it was determined that the regulatory sections applicable to the proposed improvements are:

- Section 1.3 - Stream Corridor Protection Zone (SCPZ)
- Section 1.4 – Floodplain Preservation and Developments within Special Flood Hazard Areas
- Section 1.5 - Wetland Policy
- Section 2 – Stormwater Conveyance
- Section 3 – Stormwater Control Practices
- Section 4 – Construction Verification, Operation, Maintenance and Monitoring of Stormwater Control Practices

As part of this project, fill is proposed to be placed within FEMA's Special Flood Hazard Area, above the OHWM but below the 100-year flood elevation of Big Walnut Creek. The volume of fill placed within these limits will be offset by compensatory cut within the project extents. Therefore, no variance is sought for SWDM Section 1.4 at this time.

When practical, wetlands on site will be protected per guidelines of the Ohio EPA setback requirements. If wetlands are to be impacted in construction, appropriate mitigation measures will be provided to meet the requirements of the SWDM. The stormwater design will be such that the predevelopment quantity and quality of stormwater flows directed to any protected wetlands are maintained. Therefore, no variance is sought for SWDM Section 1.5 at this time.

The introduction of impervious surfaces through development will be offset appropriately through stormwater controls. Water quantity and quality treatment will be provided per SWDM Sections 2, 3, and 4. Therefore, no variances are sought for those sections at this time.

Disturbances are proposed within the SCPZ of Big Walnut Creek. It is for this reason that the City of Columbus DOW is requesting a Type III Variance from SCPZ requirements provided in SWDM Section 1.3.

### **1.4 Affected Stream Resources and SCPZ Delineation**

Streams within the project limits include Big Walnut Creek and a 50-foot unnamed ephemeral stream that drains to the South Cell of the quarry.

SCPZ calculations were performed per Sections 1.3 and 1.5 of Columbus' SWDM. The total width of the SCPZ shall be established using the following criteria, whichever is greater:

1. FEMA's designated 100-year floodway, or



## Type III Stream Corridor Protection Zone Variance Request

### 1 Reason For Variance Request

- Using the equation below with a minimum of 50 feet to a maximum of 250 feet. The zone shall be centered on the stream valley generally located at the point where both zone boundaries intersect equal elevations on either side of the stream. Where topography is flat the zone shall be centered on the centerline of the stream:

SCPZ, in feet of width =  $147 (DA)^{0.38}$ , where DA = drainage area of the stream in square miles, or

- 50 feet from the top of each bank for fourth order streams or larger, or
- For Big Darby Creek and Olentangy River watersheds, riparian setback requirements provided within the current OEPA *General Permit Authorization for Storm Water Discharges Associated with Construction Activity under the NPDES*.

#### 1.4.1 100-YEAR FLOODWAY

For Big Walnut Creek, FEMA's effective floodway, as of the date of this report, is accepted as the basis for the SCPZ delineation under point 1 above of the SWDM guidance. It should be noted, however, that the extents of the 1-percent-annual-chance floodplain and floodway along Big Walnut Creek are currently undergoing revision under FEMA's Upper Scioto Watershed Study. The draft results of FEMA's Upper Scioto Watershed Study have been shared with the City of Columbus. The draft revised floodway is significantly smaller in size when compared to the one currently shown on the effective maps.

Furthermore, the H&H analyses prepared by Stantec as part of the No-Rise coordination (Section 1.2.1) support the conclusion that FEMA's mapped effective floodway is not an accurate representation of the hydraulic nature of Big Walnut Creek in the area.

The SCPZ was ultimately delineated based upon the mapped effective floodway for the purposes of this variance request and is depicted in Figure 2. The SCPZ delineation based upon the revised floodway is also shown for comparison and reference.

The unnamed ephemeral stream is not mapped by FEMA and therefore this section is not applicable to this stream.

#### 1.4.2 DRAINAGE AREA EQUATION

Drainage area of Big Walnut Creek at the downstream limit of the project was determined from the United States Geological Survey's web-based application, StreamStats, version 4.11.1 (<https://streamstats.usgs.gov/ss/>), to be 548 square miles. Using this methodology, the total width of the SCPZ was calculated to be 1,615 feet. Per guidance in Section 1.3 of the SWDM, the accepted width was taken as the maximum of 250 feet.

Similarly, the drainage area of the ephemeral stream was determined to be 0.12 square miles. Using this methodology, the total width of the SCPZ was calculated to be 65 feet.



**Type III Stream Corridor Protection Zone Variance Request  
1 Reason For Variance Request**

**1.4.3 50 FEET FROM TOP OF BANK**

For this section, “top of bank” is defined as a topographic grade break per meeting held between Stantec, DOW, and DOSD on July 21, 2022. The total distance from bank-to-bank on Big Walnut Creek ranges from 116 feet to 163 feet. From summing 50 additional feet from the top of each bank, the total width of the SCPZ resulting from this method ranges from 216 feet to 263 feet.

The total distance from bank-to-bank on the ephemeral stream ranges from 39 to 64 feet. From summing 50 additional feet from the top of each bank, the total width of the SCPZ resulting from this method ranges from 139 to 164 feet.

**1.4.4 CONSIDERATIONS FOR BIG DARBY CREEK AND OLENTANGY RIVER WATERSHEDS**

The project site is not located within the Big Darby Creek nor the Olentangy River Watersheds; therefore, this section is not applicable.

**1.4.5 RESULTS**

Along Big Walnut Creek, the delineation method which controls the size of the SCPZ varies throughout the project area. Figure 2 shows the different delineation methods and the controlling SCPZ for Big Walnut Creek. The SCPZ is generally controlled by Method 1 (FEMA effective floodway) in the northern part of the project area and by Method 2 (drainage area equation) in the southern portion.

Method 3 (50 feet from top of bank) controls the SCPZ delineation along the ephemeral stream.

It should be noted that the SCPZ delineations were extended to include areas of 15% slopes and wetlands per Section 1.3.1 of the SWDM.



Type III Stream Corridor Protection Zone Variance Request  
 1 Reason For Variance Request

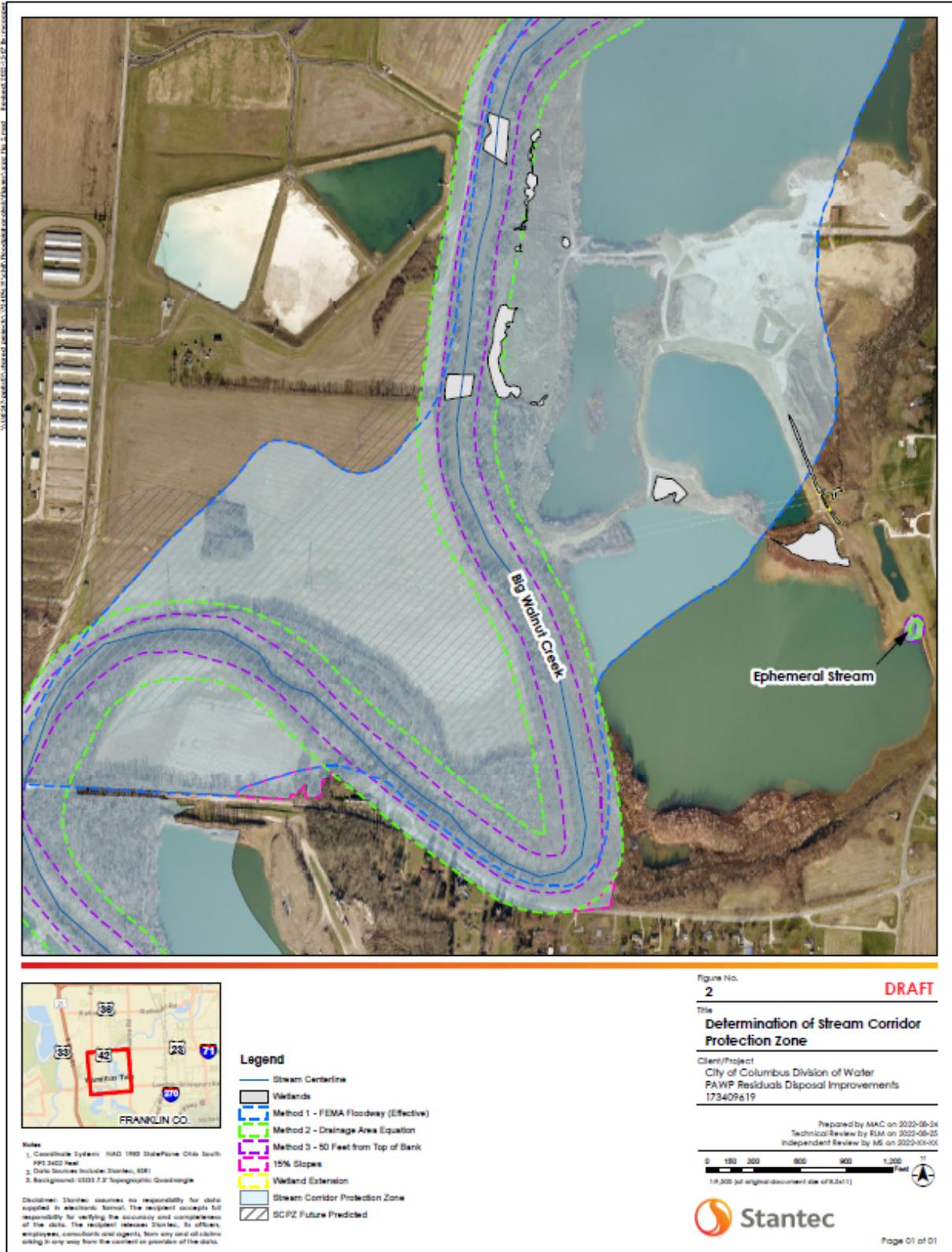


Figure 2: SCPZ Delineation

**Type III Stream Corridor Protection Zone Variance Request  
1 Reason For Variance Request**

## 1.5 Proposed SCPZ Impacts

No impacts are proposed within the SCPZ of the ephemeral stream. Protection will be installed around the limits of the SCPZ during construction for additional protection. No variance is sought related to the SCPZ of the ephemeral stream, and it is therefore not discussed further in this request.

Impacts within the Big Walnut Creek SCPZ, under the preferred alternative are presented in Table 2 below.

**Table 2: Permitted and Not Permitted Activities within SCPZ**

Item #	Impact with the SCPZ	Permitted? Yes / No
1	Construction of a paved 15' wide access road for continuous maintenance and control access	No
2	Gravel addition along existing access roads for occasional access	No
3	Construction of 4 flow control structures, including a pig launcher vault, distribution header selection vault, decant pump station, and decant valve vault	No
4	Construction of an NPDES-permitted outfall to the Big Walnut Creek	Yes
5	Temporary excavation of boring pits for utility installation via Horizontal Directional Drilling (HDD) in sensitive areas (where parallel to the stream approx. 600 feet)	No
6	Temporary excavation for open cut pipe installation, including about 600 feet of utility installation parallel to the Big Walnut Creek (where parallel to the stream)	No
7	Quarry cell wall improvements to maintain the structural integrity of the existing earth berm separating the quarry from the Big Walnut Creek, including compacted fill, sheet pile installation, and reinforced concrete T-wall	No
8	Excavation of a surface cut between quarry cell walls for level equalization across the Center West, Center East, and South Cells	No
9	Fencing around the entirety of the site for public safety and facility protection (portion in SCPZ)	No
10	Demolition of existing quarry structures (two structures within SCPZ)	No
11	Electric utility extension via aboveground poles to flow control structures	Yes
12	Selective tree removal for construction activities indicated within this request	No
13	Placement of fill to provide the Central and Southern cells protection during the 1-percent-annual-chance storm event	No

The estimated total area of impact is 19.7 acres for the Preferred Alternative.



## **1.6 Permitted Uses in the SCPZ**

Permitted uses within the SCPZ that are proposed include:

1. Removal of damaged or diseased trees as part of selective clearing required for construction activities;
2. Revegetation with plantings of native species;
3. Installation of a public utility crossing; and
4. Excavation for providing compensatory floodplain volume immediately adjacent to the channel.

## **1.7 Statement of Hardship**

Use of the LRQ as a water treatment residuals disposal site is critical to the long-term ability of Columbus DOW to treat water in a cost-effective manner. Installation of a series of force mains and flow control structures, and ground improvements to ensure the stability of the quarry, are essential to the project.

Per the delineation of the current effective FEMA floodway, much of the project site is located within the SCPZ. It then follows that many of the proposed improvements, and their associated disturbances, will be within the SCPZ. Alternative configurations and layouts which completely avoid the SCPZ are not available given the orientation of the SCPZ across the site.

As mentioned in Section 1.4.1, the effective FEMA floodway is currently undergoing revision as part of the Upper Scioto Watershed Study. Under the revised FEMA floodway, the SCPZ delineation is significantly smaller which would reduce the total disturbed SCPZ as a result. The smaller floodway delineation is also supported by this project's H&H analysis. However, this report is prepared based upon the currently mapped effective FEMA floodway orientation.

The SWDM requires that three site plans be prepared as part of a variance request: the Full Compliance Alternative, the Minimal Impact Alternative, and the Preferred Alternative. The configurations of these Alternatives are described in Section 2.

Regardless of the FEMA floodway configuration that is utilized, there are certain improvements within the SCPZ which cannot reasonably be avoided (refer to Section 2.3). These improvements must occur within the SCPZ and are essential to the functionality of the proposed work. Therefore, the only Full Compliance Alternative is to not construct the project. Under the Full Compliance Alternative of not constructing the project, water treatment residuals would need to be hauled offsite in the future at significant cost to the City. The ability of DOW to treat water in a cost-effective manner for the public would significantly be impeded under this alternative. The City also assumes significant risk to DOW's ability to treat and supply drinking water to their customers if their options to dispose of water treatment residuals are limited to offsite disposal, as there is no guarantee that these third-party beneficial use options will exist in perpetuity. Under the City's recently completed Residuals Management Plan Update, disposal of the residuals into the sanitary sewers was deemed an unviable option due to concerns with the marketability of biosolids mixed with water treatment residuals, and the same uncertainties regarding the future availability of third-party beneficial use outlets.



## **Type III Stream Corridor Protection Zone Variance Request**

### **1 Reason For Variance Request**

Under the Minimal Impact Alternative, proposed prohibited impacts are moved outside of the boundary of the SCPZ where possible. It should be noted that, as mentioned previously, some improvements must occur within the SCPZ and are essential to the functionality of the proposed work or outlined in Ohio Administrative Code (OAC). Specifically, the embankment between the quarries and Big Walnut Creek are anticipated to be classified as an earthen embankment by the Ohio Department of Natural Resources. This classification will require vegetation removal under the Levee general requirement rule (OAC 1501:21-13-10). This impact is reflected as part of the quarry wall improvements category. Under this alternative, the disturbed acreage within the SCPZ decreases, but at an increased cost to the City. Some disturbances would remain in the SCPZ, and mitigation would still be required.

The Preferred Alternative allows for site improvements to be performed in the most hydraulically preferable and cost-effective locations for the project. This allows capital and operational expenses for the residuals disposal facility to be lower when compared to the Minimal Impact Alternative. Although SCPZ disturbances are slightly more under this alternative than the Minimal Impact Alternative, appropriate mitigation would be conducted per the SWDM.

The Type III Variance would allow DOW to make necessary improvements to the property for its proposed use as a drinking water treatment residuals disposal site. Without an approved variance, the site cannot feasibly be used for its intended purpose.



## 2 Project Alternatives

### 2.1 Preferred Alternative

A list of disturbances intended for the LRQ site under the Preferred Alternative is provided in Table 3 with acreage impacted by each use provided. To reduce total impacted area, any disturbances proposed within the SCPZ were evaluated for potential to combine impacts. For instance, utility corridors are proposed under or next to the access road where applicable to reduce the overall disturbance within the SCPZ. The sum of the individual disturbances will therefore appear higher, but the total SCPZ disturbance area reflects combined impact areas. The total estimated SCPZ disturbance under the Preferred Alternative is 19.7 acres. Total acreage for permitted and non-permitted impacts are 2.08 and 17.62 respectively.

**Table 3: Summary of Preferred Alternative Activities and Disturbance Area**

Activity	SCPZ Disturbance (acre)	Details	Permitted? Yes / No
15' Paved Road and Existing Gravel Road Improvements for Maintenance Access	5.42	Includes 30-ft buffer around road	No
Structure Installation for Maintenance and Control of Residual Flow	0.15	Includes: - Pig Launcher Vault: 40 ft x 20 ft with 12-ft buffer - Distribution Header Valve Vault: 15 ft x 15 ft with 12-ft buffer - Decant Pump Station: 15 ft x 15 ft with 12-ft buffer - Decant Valve Vault: 15 ft x 15 ft with 12-ft buffer	No
Existing Quarry Wall Improvements	6.93	Includes: - Compacted Cell Wall Filling with no buffer - Sheet Piling with 30-ft buffer - Reinforced Concrete T-Wall with 30-ft buffer - Vegetation removal for improved wall plus 20 feet from toe	No
NPDES-Permitted Outfall Structure to Big Walnut Creek	0.04	Includes 12-ft buffer around structure	Yes
Excavation to provide surface cut between quarry cells for level equalization	0.09	Includes approximately 50' x 50' of excavation per cut	No
Fencing for Public Protection at DOW-Operated Facility	3.48	Includes 12-ft buffer around the 6-ft tall fence. Fence is to be installed around the entire LRQ property	No
Stormwater BMPs	2.04	Location and size of BMPs are variable	Yes
Demolition	0.41	A total of four structures to remove, only two are within the SCPZ	No
Utility Corridors Boring Pits	0.06	Includes one 80 ft x 25 ft pit with no buffer.	No
Distribution Header (Open Cut) and Outfall Pipe	7.16	Includes: - Distribution Header with 30-ft buffer - Outfall Pipe with 12-ft buffer	No

As indicated in Section 1.7, the intent for the Preferred Alternative was to keep disturbances within the SCPZ reasonably minimized while allowing for feasible costs of construction, operation, and maintenance



**Type III Stream Corridor Protection Zone Variance Request  
2 Project Alternatives**

of this critical DOW facility. Proposed improvements along with current effective SCPZ and future expected SCPZ are shown in Figure 3.



# Type III Stream Corridor Protection Zone Variance Request 2 Project Alternatives

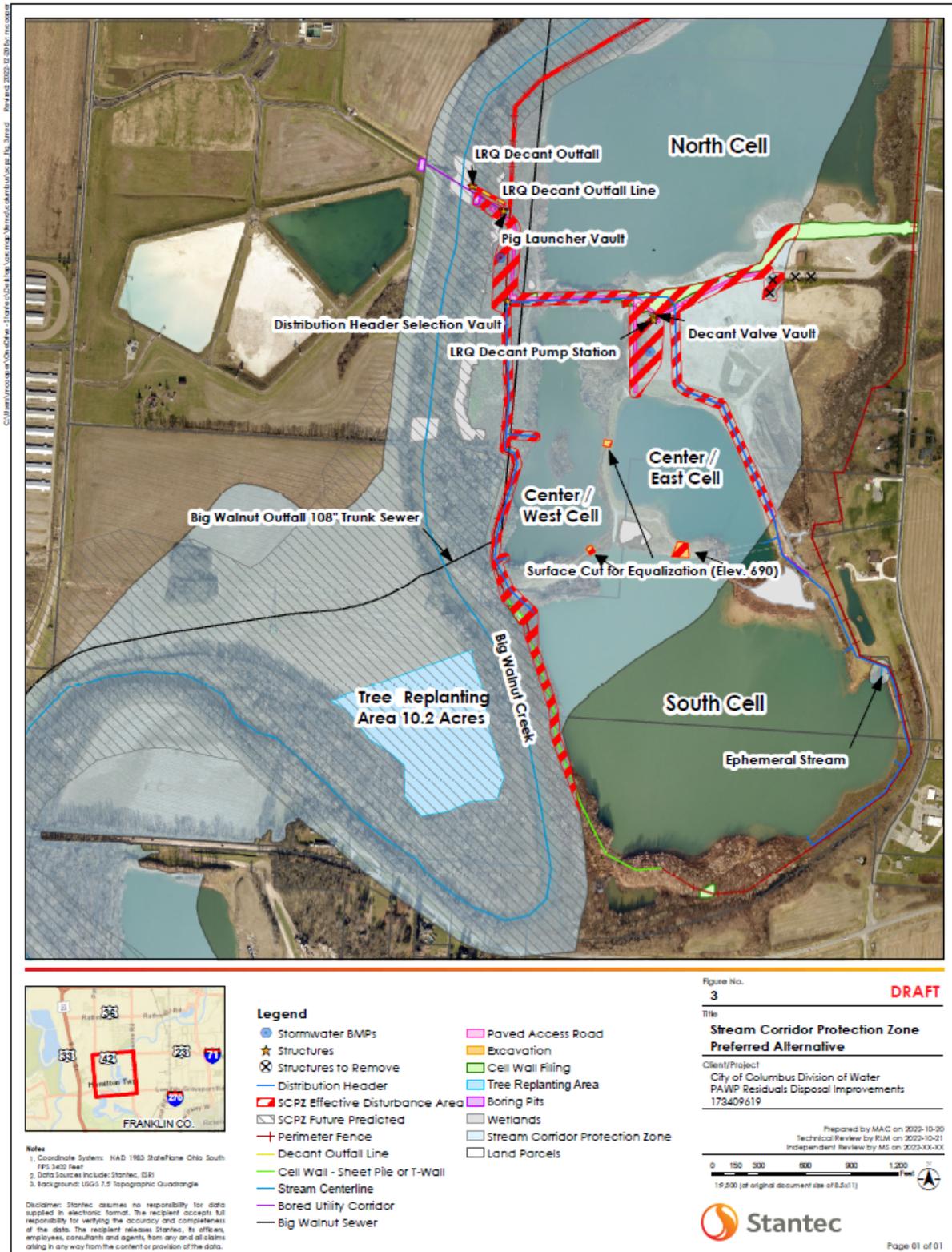


Figure 3: SCPZ Preferred Alternative



## 2.2 Minimal Impact Alternative

A list of disturbances intended for the LRQ site under the Minimal Impact Alternative is provided in Table 4 with acreage impacted by each use provided. To reduce total impacted area, any disturbances proposed within the SCPZ were evaluated for potential to combine and minimize impacts. The total estimated SCPZ disturbance under the Minimal Impact Alternative is 14.9 acres. Total acreage for permitted and non-permitted SCPZ disturbances are 0.66 and 14.24 respectively.

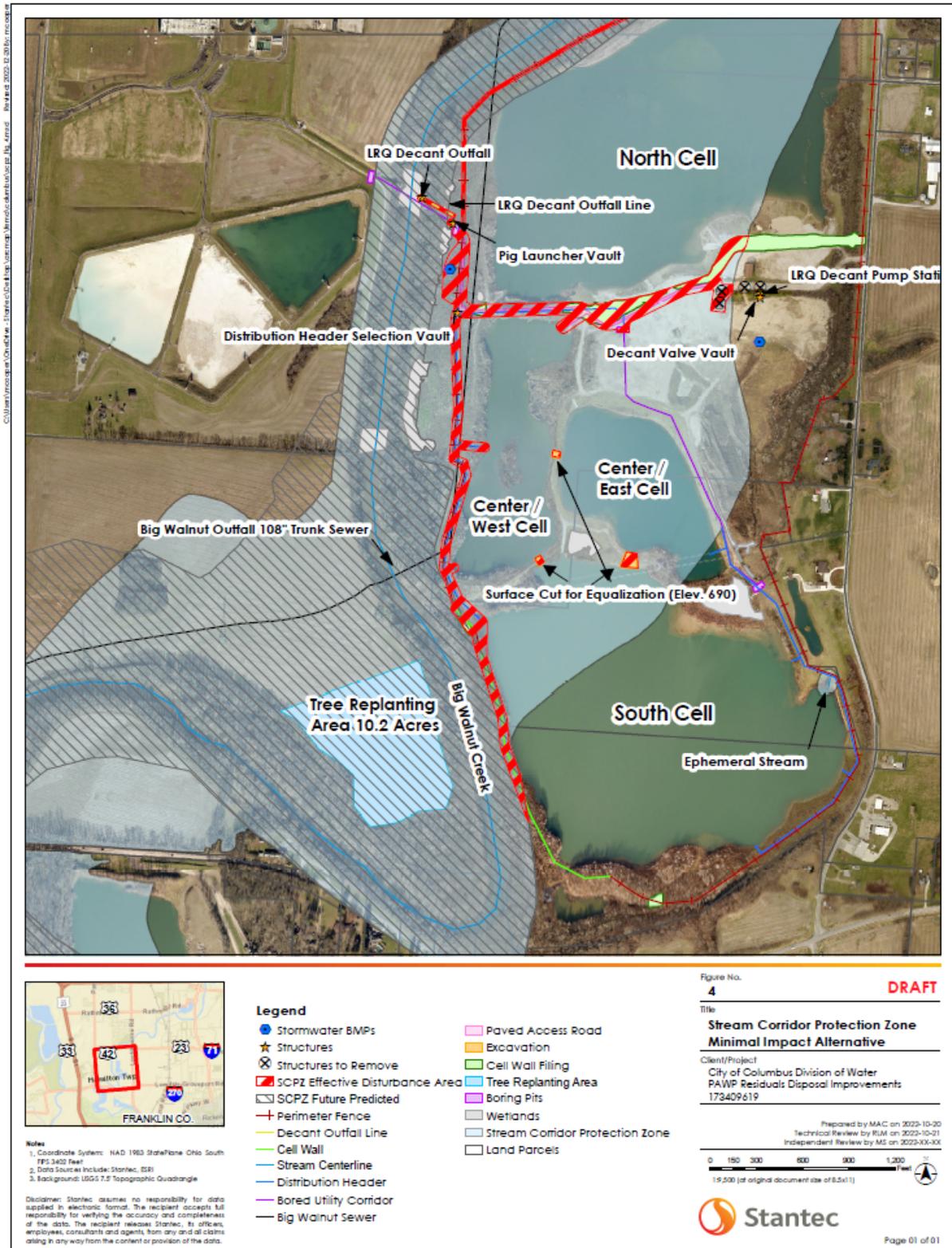
The Minimal Impact Alternative has been proposed to reduce SCPZ impacts. Structures included in the Preferred Alternative that can be moved out of the SCPZ are located further east, including the LRQ Decant Pump Station and the Decant Valve Vault. This will increase operational costs due to additional pumping required to cover the increased distance. The vegetation removal shown in the existing quarry wall improvements category is included because of provisions outlined in OAC under the Levee general requirement rule (1501:21-13-10). In addition, HDD boring is proposed for the distribution header along the east side of the site, allowing for reduction of disturbed area along this corridor. HDD is not proposed along the west side of the site because the fence and cell wall improvements will also be creating disturbances along this corridor, which can then be combined with the open cut header installation. Additionally, the Big Walnut Outfall Trunk sewer which runs along the west side of the site is critical to the Columbus sewer network. Open cut installation will help to ensure the new infrastructure in this corridor does not damage the trunk sewer. Proposed improvements along with current effective SCPZ and future expected SCPZ are shown in Figure 4.

**Table 4: Summary of Minimal Impact Alternative Activities and Disturbance Area**

Activity	SCPZ Disturbance (acre)	Details	Permitted? Yes / No
15' Paved Road and Existing Gravel Road Improvements for Maintenance Access	3.51	Includes 30-ft buffer around road	No
Structure Installation for Maintenance and Control of Residual Flow	0.09	Includes: - Pig Launcher Vault: 40 ft x 20 ft with 12-ft buffer - Distribution Header Valve Vault: 15 ft x 15 ft with 12-ft buffer	No
Existing Quarry Wall Improvements	5.59	Includes: - Compacted Cell Wall Filling with no buffer - Sheet Piling with 30-ft buffer - Reinforced Concrete T-Wall with 30-ft buffer - Vegetation removal for improved wall plus 20 feet from toe	No
NPDES-Permitted Outfall Structure to Big Walnut Creek	0.04	Includes 12-ft buffer around structure	Yes
Excavation to provide surface cut between quarry cells for level equalization	0.09	Includes approximately 50' x 50' of excavation per cut	No
Fencing for Public Protection at DOW-Operated Facility	3.49	Includes 12-ft buffer around the 6-ft tall fence. Fence is to be installed around the entire LRQ property	No
Stormwater BMPs	0.62	Location and size of BMPs are variable	Yes
Demolition	0.44	A total of four structures to remove, only two are within the SCPZ	No
Utility Corridors Boring Pits	0.14	Includes two 80 ft x 25 ft pits with no buffer.	No
Distribution Header (Open Cut) and Outfall Pipe	4.96	Includes: - Distribution Header with 30-ft buffer - Outfall Pipe with 12-ft buffer	No



# Type III Stream Corridor Protection Zone Variance Request 2 Project Alternatives



**Figure 4: SCPZ Minimal Impact Alternative**



## **2.3 Full Compliance Alternative**

There is no economically viable Full Compliance Alternative without loss of the intended function of the site and increase in public safety risk. Flow control and maintenance vaults are necessary on the west side of the LRQ site to allow for distribution of the water treatment residuals. Cell wall improvements are critical to ensuring both that the quarry cells continue to hold the residuals intended for them and that the quarry does not pose a threat to public safety due to unexpected collapse and inherent risk to watercraft in the area that may trespass on the site. It is also critical that the cell walls can withstand a 1-percent-annual-chance flood event on Big Walnut Creek to provide flood protection per Ten States Standards. Finally, fencing around the entirety of the site is needed to prohibit public access to the site, reducing the risk of accidental drowning in the quarry cells as well as protecting important City assets after construction.

The aforementioned improvements must be installed within the SCPZ to be functional, and all require land disturbances. As these disturbances cannot be avoided while maintaining the intended use of the project, the only Full Compliance Alternative is to not construct the project.



## 3 Mitigation

### 3.1 Mitigation Requirements

The impacts of the proposed improvements that are to be mitigated are limited to the SCPZ. SWDM requirements for mitigation of SCPZ impacts include:

1. If a temporary impact is proposed, then the SCPZ must be restored to preserve or improve the existing SCPZ quality and function.
2. If the proposed impact removes a portion of the SCPZ, then the applicant must provide adequate mitigation by creating equivalent mitigation SCPZ elsewhere or perform adequate ecological mitigation work on-site or off-site to replace functions lost as a result of the proposed impact. Proposed mitigation shall be considered sufficient if additional equivalent SCPZ is created, or SCPZ mitigation work is performed at the following ratios:
  - a. On site: 1 to 1
  - b. Adjacent site: 1 to 1.5
  - c. Within same HUC-12: 1 to 2
3. Generally, mitigation of the SPCZ will be considered equivalent if it performs the same function as the disturbed SPCZ; for instance, if the disturbed SPCZ includes trees, the mitigation SPCZ should include at least an equivalent number of trees.

### 3.2 Proposed Mitigation for SCPZ Impacts

In locations with temporary SCPZ impacts, DOW is proposing to mitigate SCPZ disturbances by replacing with native trees and shrubs to preserve the existing SCPZ quality and function.

Permanent SCPZ disturbances are equivalent under the Preferred and Minimal Impact Alternatives. From a review of available aerial imagery, it was determined that approximately 10.2 acres of wooded areas will be cleared as a result of this project. To mitigate for these disturbances, DOW proposes to perform 1 to 1 mitigation (or 10.2 acres) for the SCPZ area lost in the SCPZ area to the west of Big Walnut Creek.

This work may include removal of invasive species and planting native trees and shrubs as well as seeding and mulching with appropriate native species to improve the quality and function of SCPZ on this site. Further analysis of the specific quantity of trees to be removed and replaced will occur in detailed design to inform the selection of ideal locations for SCPZ mitigation. The preliminary SCPZ mitigation area is shown on Figure 3 and Figure 4.



## 4 Conclusion

Approval of a Type III SWDM variance is sought for the construction of a water treatment residuals disposal facility with elements within the SCPZ of the Big Walnut Creek for the proposed Preferred Alternative. Without an approved variance, this facility cannot be constructed at the LRQ. H&H analysis of the site has established that the current FEMA effective floodplain is outdated and will likely see significant updates in the area of the LRQ in the next map update, which is currently undergoing revision through FEMA's Upper Scioto Watershed Study. Modeling and preliminary FIRM maps show that the SCPZ extents would be significantly reduced and thus the real impacts of the proposed work are anticipated to be much less than those reflected in this variance request.

Two alternatives for improvements were considered. The Preferred Alternative minimizes disturbances within the future anticipated SCPZ while providing the most cost-effective option for DOW. The Minimal Impact Alternative adjusts or relocates proposed improvements where feasible to minimize disturbances throughout the current SCPZ, incurring additional capital and operating cost to the DOW. Appropriate SCPZ mitigation measures will be provided on-site for the full extent of disturbances within the current SCPZ for either alternative to meet SWDM Section 1.3 requirements.

The only Full Compliance Alternative is to not construct the project. If the City is not able to construct the project, the DOW will be operating with a major risk to its ability to continue to meet its water supply obligations to its customers. If the DOW cannot find offsite options to dispose of water treatment residuals, it will have to shut down and the cost implications are incalculable at this time. This existential threat led the City to undertake the recently completed Residuals Management Plan Update which concluded that residual disposal at LRQ in addition to existing third-party offsite beneficial use provides the City with multiple outlets to sustain the functioning of the PAWP.

Approving a Type III SWDM variance for the Preferred Alternative is therefore critical to the ability of the City and DOW to treat water in a cost-effective and sustainable manner to fulfill its obligations to its customers.

