FULCRUM
environmental consulting

Engineering Design Report for WSP Landfill Cleanup

Washington State Penitentiary
Walla Walla, Washington

Facility Site 779
Cleanup Site 4971
Agreed Order No. DE 13229

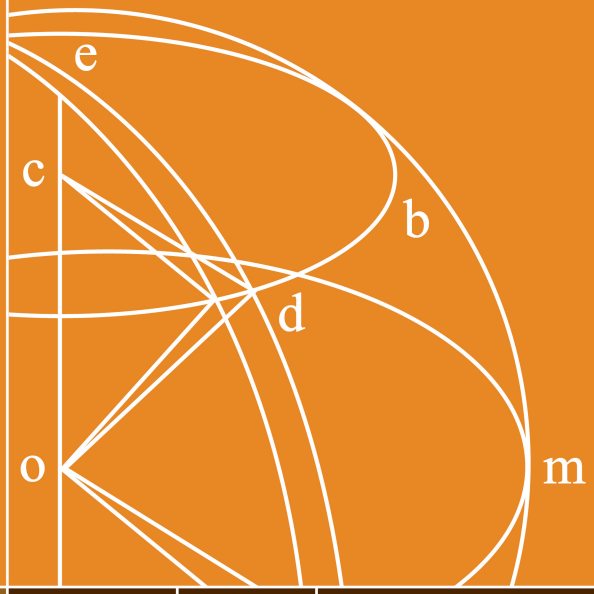
May 30, 2017

Prepared for:

Washington State Department of Corrections
Attn: Donald R. Holbrook, Superintendent,
Washington State Penitentiary
1313 North 13th Street
Walla Walla, Washington 99362

Prepared by:

Fulcrum Environmental Consulting, Inc.
406 North 2nd Street
Yakima, Washington 98901



Report Title: Engineering Design Report of WSP Landfill Cleanup

Project Number: 161909.00

Date: May 30, 2017

Site: Washington State Penitentiary, 1313 North 13th Street, Walla Walla, Washington

Prepared for: Washington State Department of Corrections
Attn: Donald R. Holbrook, Superintendent, Washington State Penitentiary
1313 North 13th Street
Walla Walla, Washington 99362

Prepared by: Fulcrum Environmental Consulting, Inc.
406 North Second Street
Yakima, Washington 98901
509.574.0839

The professionals who completed site services, prepared, and reviewed this report include but are not limited to:

Authored by:  **Date:** 5.30.17

Amanda Johnson, GIT
Fulcrum Environmental Consulting, Inc.

Reviewed by:  **Date:** 5.30.17

Ryan K. Mathews, CIH, CHMM, Principal
Fulcrum Environmental Consulting, Inc.

Report Integrity:

Fulcrum Environmental Consulting, Inc.'s scope of service for this project was limited to those services as established in the proposal, contract, verbal direction, and/or agreement. This report is subject to applicable federal, state, and local regulations governing project-specific conditions and was performed using recognized procedures and standards of the industry. Scientific data collected in situ may document conditions that may be specific to the time and day of service, and subject to change as a result of conditions beyond Fulcrum's control or knowledge. Fulcrum makes no warranties, expressed or implied as to the accuracy or completeness of other's work included herein. Fulcrum has performed these services in accordance with generally accepted environmental science standards of care at the time of the inspection. No warranty, expressed or implied, is made.

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below during his period of employment with Fulcrum Environmental Consulting, Inc.

Norman T. Hepner, P.E.

ACRONYMS AND ABBREVIATIONS

BGS	below ground surface
CAP	Cleanup Action Plan
cy	cubic yard of material
dCAP	draft Cleanup Action Plan
DOC	Washington State Department of Corrections
DES	Washington State Department of Enterprise Services
Ecology	Washington State Department of Ecology
MTCA	WAC 173-340, the Model Toxics Control Act
QPL	Qualified Products List
oz	ounce weight per square foot of material
RI	Remedial Investigation
VOC	Volatile Organic Compounds
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation
WSP	Washington State Penitentiary

TABLE OF CONTENTS

Section			Page
1.0	Introduction		1
2.0	Purpose		3
	2.1	Landfill History	3
	2.2	Nature and Extent of Contamination	3
	2.3	Pertinent Regulations	4
	2.4	Selected Remedy	4
	2.5	Rationale	4
3.0	Site Conditions		5
	3.1	Location	5
	3.2	Topography	6
	3.3	Geology	6
	3.4	Hydrogeology	6
	3.5	Stormwater	7
4.0	Landfill Cleanup Cover Design		7
	4.1	Selected Remedy	8
	4.2	Source Soils and Crushed Rock	8
	4.3	Geotextile Fabric	9
	4.4	Silt Fence	9
5.0	Landfill Construction Tasks		9
	5.1	Work Area Preparation	9
	5.2	Site Access	10
	5.3	Grading	10
	5.3	Placement of Soil and Fabric/Rock Cap	10
	5.4	Seeding of Cap	11
6.0	Other Construction Tasks		11
	6.1	Well Decommissioning	11
	6.2	Low-Permeability Cap (former Dry Cleaner Building)	12
7.0	Post-Cleanup Monitoring Activities		12
	7.1	Groundwater Monitoring	12
	7.2	Visual Inspection	13
	7.3	Responsible Parties	13
8.0	Cleanup Schedule		13
9.0	References		14

Figures

Figure 1 Site Location
Figure 2 WSP Site Boundary
Figure 3 Existing Landfill Grades
Figure 4 Landfill Elevation
Figure 5 Geotextile and Compacted Crushed Rock Placement
Figure 6 Silt Fence Installation Detail
Figure 7 Construction Access Map
Figure 8 TESC Detail Drawings
Figure 9 Cap Design Details
Figure 10 Current Stormwater Subbasin Areas
Figure 11 Existing Stormwater Controls

Appendices

Appendix 1 Draft Environmental Covenant
Appendix 2 Compliance Monitoring Plan

1.0 INTRODUCTION

This Engineering Design Report (Plan) describes the final cleanup actions to be completed to implement the selected cleanup alternative as specified in the Cleanup Action Plan (CAP) for the Washington State Penitentiary (WSP) Landfill in Walla Walla, Washington. The Washington State Department of Corrections (DOC) retained Fulcrum Environmental Consulting, Inc. (Fulcrum) to prepare this Plan as required under Washington Administrative Code (WAC) 173-340-400: *Implementation of the cleanup action*. The intent of the CAP is to complete cleanup of the WSP Landfill/Former Dry Cleaner consistent with Agreed Order DE 13229.

The Site is referred to as the Washington State Penitentiary and is generally located at 1313 North 13th Street, Walla Walla, Washington. See Figure 1 for the location of the Site. The Site is identified by the extent of contamination caused by the release of hazardous substances at the Site. The portion of the Site addressed in this Plan is the former landfill and former dry cleaner building located near the northwest extent of WSP. The WSP Landfill is northwest of the facility and occupies 7.7 acres. See Figure 2 for the extent of the landfill site.

Under Agreed Order No. DE 13229 the work to be performed includes the following:

- Conduct quarterly groundwater monitoring to assess performance of the cleanup action in accordance with the Compliance Monitoring Plan approved by Ecology.
- Placement of restrictive covenants to include institutional controls to prevent exposure at the landfill and areas with soil contamination near one former dry cleaner building. These would include deed restrictions (an institutional control) that prohibits soil excavation or disturbance within the specified area and depth intervals without prior consultation with Ecology, prohibits disturbing the landfill soil cover or waste, prohibits modifying of the existing stormwater facilities, and prohibits the use of groundwater at the landfill with an institutional control. Improving the existing permeable landfill soil cap will prevent exposure to contamination caused by releases at the Site, provide a direct contact barrier, reduce infiltration, enhance evapotranspiration, and protect ecological receptors. Soil cap improvements over about 1.8 acres will include re-grading and placement of additional material to cover exposed debris, correct surface irregularities, and provide positive drainage. Approximately 0.7 acres of geotextile barrier overlain by 12-inches of compacted crushed rock in identified areas of soil contamination will be installed to prevent exposure of ecological receptors. Separation geotextile and clean aggregate cover have been determined to provide protection to burrowing animals from underlying contaminated soil (*United States Department of Interior, 2011*).
- Install an approximately 0.1 acre low permeability asphalt cap in the vicinity of the former dry cleaner building, consisting of 6 inches of crushed rock, 2.5 inches of asphalt concrete pavement, and stormwater control structures – note that any material generated by subgrade excavation for the paving would have to be tested for contaminants before being used for any re-grading activities.
- Decommission Irrigation Well No. 4

Except for select tasks, such as relocation of capping soils, well decommissioning, and groundwater monitoring, all construction tasks will be self-performed by DOC.

This Plan consists of the following sections:

Section 2 provides a review of the background and purpose of the work

Section 3 presents a summary of the general site environmental characteristics

Section 4 provides landfill cleanup cover design

Section 5 provides landfill construction tasks

Section 6 provide other construction tasks

Section 7 provides post-cleanup compliance monitoring

Section 8 provides the cleanup schedule, subject to funding by the Washington State Legislature

This Plan includes design drawings [see Figures] and quality assurance requirements [see Appendices] that have been prepared in sufficient detail to be used during DOC's completion of the work.

2.0 PURPOSE

The purpose of the CAP is to prevent exposure to contamination caused by releases at the former WSP Landfill and former Dry Cleaner building.

2.1 Landfill History

Previous research has established that the WSP Landfill served as the principal disposal site for construction and demolition debris, ash from the penitentiary boiler, and yard and agricultural waste from the assocaited agricultural production from the early 1970s until 1987 (HWA 1998). Additionally, when the landfill was created in the early 1970s, a culvert was installed in the natural swale of an east-west-trending intermittent drainage channel to allow drainage to continue to flow under the landfill. The construction details and materials used for the culvert are unknown (HWA 1998).

The two cells, referred to in past reports as the East Cell and West Cell, are divided by a lightly graveled roadway. The East Cell consists of about 3.4 acres and the West Cell l about 4.3 acres. The operational history of the landfill suggests that al some time both native soils and boiler ash was placed in a 1-foot layer above the landfill materials (Parametrix 2012).

In December 1991, Ecology received an anonymous complaint alleging that hazardous substances had been disposed of in the closed WSP Landfill. Materials allegedly dumped were hazardous chemicals, solvents, paints, thinners, and medical wastes. Ecology placed the WSP Landfill on the Confirmed and Suspected Contaminated Sites List in June 1992 following completion of an initial site investigation of the WSP Landfill in March 1992 (Parametrix 1995).

From 1991 through 1998, groundwater monitoring data from samples collected downgradient of the WSP and at the WSP Landfill indicated that concentration levels for volatile organic compounds (VOCs) in the shallow alluvial aquifer sometimes exceeded MTCA Method A and Washington State Maximum Contaminant Levels (MCLs) for drinking water. Levels of nitrate-nitrogen and Total Dissolved Solids (TDSs) sometimes exceeded MCLs for drinking water. VOCs detected within the groundwater include trichlorofluoromethane, perchloroethylene (PCE, also called tetrachloroethylene), trichloroethylene (TCE), and chloroform. Toluene has been confirmed as a contaminant in surface water at the WSP Landfill (HWA 1998, Parametrix 2012).

2.2 Nature and Extent of Contamination

While initial investigation of the landfill was completed in 1992 and a Site Hazard Assessment in 1995, investigation of the WSP Landfill did not begin until completion of Remedial Investigation scoping and work plan development in 2009 and completion of a Remedial Investigation in 2012.

The RI identified contaminants of concern, including Carcinogenic Polyaromatic Hydrocarbons (cPAHs), lead, and tetrachloroethylene (PCE) in Landfill soils within 15-feet of the surface.

No contaminants were reported to be in groundwater at levels above MTCA in monitoring wells located hydraulically downgradient of the WSP Landfill.

2.3 Pertinent Regulations

WSP Landfill cleanup is governed by the Agreed Order No. DE 13229. However, WAC 173-304: *Minimum functional standards for solid waste handling,* provides a sound engineering basis for the requirements of a cleanup cover system. A sound cleanup cover system would:

- Minimize the need for further maintenance
- Controls, minimizes, or eliminates threats to human health and the environment from post-closure escape of solid waste constituents, leachate, landfill gases, contaminated rainfall or waste decomposition products to the ground, groundwater, surface water, and the atmosphere
- Grade of surface slopes shall not be less than two percent, nor the grade of side slopes more than thirty-three percent
- Establishes soil cover with seeded grasses or other native vegetation.

2.4 Selected Remedy

Following completion of a Remedial Investigation (RI), review of remedial options in a Feasibility Study (FS), selection of the most effective remedial alternative, preparation of a draft Cleanup Action Plan (dCAP) and review of public comments, a CAP was finalized and documented in an Agreed Order. The CAP specifies the use of permeable cover improvements to the Landfill Site to provide a direct contact barrier, reduce infiltration, enhance evapotranspiration, and protect ecological receptors. To achieve the permeable cover improvements, the existing surface is to be graded to correct surface irregularities and provide positive drainage. Where exposed debris is present soils shall be used to cover the debris.

Soil cap improvements over about 1.8 acres will include re-grading and placement of additional material to cover exposed debris, correct surface irregularities, and provide positive drainage. Approximately 0.7 acres of geotextile barrier overlain by 12-inches of compacted crushed rock in identified areas of soil contamination will be installed to prevent exposure of ecological receptors.

2.5 Rationale

As provided in Parametrix's RI/FS for the Site:

> Landfill capping is a containment technology that forms a barrier between the contaminated media and the surface, thereby shielding humans and the environment from the harmful effects of its contents and perhaps limiting the migration of the contents. Cap design ranges from low permeability geomembrane designs that reduce over 99% of infiltration to more permeable soil covers. The cap design should be selected based on the necessity to reduce infiltration into the contaminated subsurface to reduce the potential for contaminants to leach from the Site. Water allowed to seep through the barrier and saturate the contaminated soil ultimately flows into groundwater and contaminating the groundwater with the contaminants found in the soil.

Landfill capping does not lessen the toxicity, mobility, or volume of contaminants, but they do limit migration. They are most effective where most of the underlying soil is above the water table. Cap integrity must not be compromised by present and/or future land use activities and institutional controls are often required to protect the cap.

Permeable soil covers, which typically consists of locally obtained, unimproved soil, provide only a barrier to direct contact with the waste and through grading eliminate low spots within the landfill cover that collect water and focus infiltration. Permeable soil covers are typically planted with vegetation to address erosion concerns and enhance evapotranspiration. A permeable soil cover is currently in place at the WSP landfill and considering the absence of groundwater contamination appears to be effective in reducing the migration of contaminants from soil and waste to groundwater. Improving areas of the WSP Landfill where waste is exposed at the surface and where surface water run-off is collecting in low spots could be effective in providing a direct contact barrier and further reducing some infiltration.

3.0 SITE CONDITIONS

3.1 Location

The site is located in the north portion of Walla Walla, Washington. The WSP is an active state corrections facility located in the southeastern corner of the state of Washington in the City of Walla Walla. The WSP facility consist of both the WSP inmate managed area and surrounding undeveloped and agricultural land owned by the State of Washington. The WSP property, including all parcels, structures, and improvements both inside and outside the confined areas and occupies 560 acres. The WSP Landfill is northwest of the facility and occupies approximately 7.7 acres.

The Site is situated on the northern slope of the east-west-trending Walla Walla Valley. The valley is gently undulating and of low local relief. The Site elevation generally ranges from 850 to 950 feet above mean sea The Site is bounded on the east by privately-owned land and on the west by the wastewater application section of the Sudbury Road Landfill and several upgradient groundwater monitoring wells owned by Sudbury Road Landfill. State Highway 125 and more privately-owned land bounds the Site on the north. The Site is bounded on the south by Mill Creek and a drainage pond located on a privately-owned parcel that receives stormwater from the WSP and other properties in its vicinity. Properties to the east and south of the WSP include junkyards and industrial, fuel, and agricultural-chemical facilities. A Burlington Northern Santa Fe Railroad (BNSF) line that serves local industries is located along the southern edge of the property. The City of Walla Walla also bounds the Site on the south. The WSP is topographically and hydraulically upgradient of the Sudbury Road Landfill and downgradient of properties to the east and south (Ecology 2009a, Parametrix 2012).

3.2 Topography

The general area of the Site consists of rolling hills from the north transitioning to the valley floor to the south. Along this topographic transition, land use transitions from dryland wheat to industrial properties with municipal, commercial, and residential buildings on the valley floor. More than 70 feet of elevation change occurs across WSP from the northeast to the southwest.

Across the landfill Site, the topographic change is opposite the localized topography. The highest elevation is present along the south boundary of the landfill adjacent a paved WSP roadway. Transition to the north, the surface elevation decreases as at rate of about 8-feet over a 350-foot length. A steep drop along the north extent of the buried landfill material results in an additional about 15-feet of elevation change in about 15-feet.

3.3 Geology

Walla Walla is located on the southern margin of the Columbia Plateau in the foothills of the Blue Mountains (east and southeast of town). Regional bedrock is Miocene Age basalt rock. A southward trending monocline fold in the plateau basalt overlain by alluvial (Spokane Flood) deposits and Palouse loess (windborne sediment) deposits dominates regional geomorphology. These unconsolidated deposits act as part of the aquifer system. Some unconsolidated deposits fill basins near the Walla Walla River Valley in places up to 800-feet (ft) deep. In the vicinity of the city of Walla Walla, these deposits (mostly sand and gravel) yield up to 1,000-gallons of water a minute. A number of small streams and creeks pass through the Walla Walla area, including Mill Creek, located along the southern extent of WSP.

As reported in the RI/FS, fill in the WSP Landfill typically consisted of silt and sand with gravel and occasional construction material (brick or asphalt) in layers of 1 to 3 feet thick. Loess deposits (windblown, non-stratified silt) ranged approximately 8 to 50 feet thick and consisted of very soft, generally moist and of varied color (brown, light brown, dark brown, reddish brown, tan, and tannish brown). Below the loess, investigations identified alluvium depositions consisting of gravelly sands and sandy gravels observed to include weathered, subrounded basalt. According to logs for water wells at the Site, the gravels at the Site are underlain by an approximately 250 foot thick sequence of clays separating the gravels from underlying formations. Basalt is encountered at depths of about 500 feet near WSP (Parametrix 2012).

3.4 Hydrogeology

Two main aquifers occur in the Walla Walla area, and are referred to as the gravel aquifer and the deeper, basalt aquifer. The gravel aquifer is approximately 200 feet thick in the WSP area, and is overlain by the Palouse Formation loess (Parametrix 1995). The top of the basalt aquifer is approximately 500 feet deep in the WSP area. The two aquifers are separated by 250 to 300 feet of clay. Groundwater in the basalt aquifer is under confined conditions, with a potentiometric surface of approximately 50 feet bgs in the WSP area (Parametrix 1995). The gravel aquifer appears unconfined in the WSP area. Hydrogeologic studies in the Walla Walla area indicate a westward horizontal gradient in the gravel aquifer and a net upward vertical groundwater gradient from the basalt aquifer to the gravel aquifer (Parametrix 1995).

Depth to water levels measured in the RI/FS monitoring wells during installation indicate that first encountered groundwater in the gravel aquifer ranges from approximately 24 to 82 feet bgs at the Site in July 2011 (Table 4). The groundwater elevation in MW-6 is approximately 30 feet higher than the other site monitoring wells. This well was completed in alluvial soils, and the groundwater elevation represents groundwater perched on fine-grained soils within the alluvium. This water level elevation was not incorporated into water level elevation contour maps or gradient calculations. Generally, site groundwater (excluding MW-6) ranges from approximately 40 to 99 feet bgs depending on location. Groundwater fluctuation appears to range between 4 and 5 feet between wet and dry seasons based on the current data collected from the remedial investigation.

3.5 Stormwater

Site stormwater is managed through a system designed in about 2004 and implemented in 2009. In the area near the WSP Landfill, parking lot and roadway precipitation is collected in a settling pond located immediately east of the WSP Landfill. Overflow from the settling pond is conveyed by pipe from the north extent of the pond into a swale-like ditch that flows from the east to a topographically low area north of the WSP Landfill for infiltration.

Department of Ecology has determined that any maintenance to the existing stormwater system and minor modifications to improve the flow of stormwater past the landfill are required under the Consent Decree and as permitted by WAC 173-340-710 (9) shall be implemented to reduce or eliminate discharge of water into the landfill. Further it is recognized that all stormwater remains within the property boundaries of the WSP.

Planned maintenance includes removal of sediment from infiltration ponds, repair or cleaning of check dams and rock outfalls, installation of piping through the existing stormwater pond located east and hydraulically upgradient of the landfill, and extension of existing piping along and through the north portion of the landfill to a new release location approximately 400-feet west. No new stormwater control features will be placed during the work, only the relocation of one rock outfall.

4.0 LANDFILL CLEANUP COVER DESIGN

The Selected Remedy was determined following the steps provided in MTCA including the Remedial Investigation and Feasibility Study. This Plan is intended to implement the selected capping of the WSP Landfill with native soils as a permeable cap. Where specified, material selections to implement the Plan shall conform to Section 9 of WSDOT's *Standard Specifications for Road, Bridge, and Municipal Construction*, M41-10, August 1, 2016 and be listed in the WSDOT Qualified Product List (QPL) as approved for use. The intent of this Plan is not to establish the means and methods of the work, but to identify the performance standards for the work and associated materials.

4.1 Selected Remedy

The selected remedy has been selected to improve the existing permeable landfill soil cap and provide a direct contact barrier, reduce infiltration, enhance evapotranspiration, and protect ecological receptors. The cap will consist of placement of a permeable 12-inch soil cap on the landfill and localized placement of 4.0 ounce or better nonwoven geotextile with 12-inches of compacted crushed rock above areas of identified soil contamination.

Soil cap improvements over the landfill will include re-grading and placement of additional material to cover exposed debris, correct surface irregularities, and provide positive drainage. Approximately 0.7 acres of geotextile barrier overlain by 12-inches of compacted crushed rock in identified areas of soil contamination will be installed to prevent exposure of ecological receptors.

4.2 Source Soils and Crushed Rock

Excess soils generated during a WSP project will be used to cap areas requiring only soil placement. Native soils consist of silty loam. The soil stockpile is located approximately 2/3 mile south of the WSP Landfill adjacent to WSP's firing range. Soils consist of native Walla Walla silt loam formed from loess. The soil is reported to have a moderately high to high water holding capacity. The soil has been tested according to the following Ecology-directed sampling protocol:

1. Soil stockpile was divided into 10 equal sections according to the following:
   - Divided down the middle, east to west
   - Divided every 60 feet north to south
2. A random sample location was chosen from each section by throwing a wooden stake in the air. Where the stake landed, a sample was taken. After the sampling was finished the wooden stake was marked with the sample identifier and driven in the bottom of the hole for future reference.
3. For each sample a hole was dug with a clean shovel to a depth of approximately 12". The shovel was cleaned of loose material with gloved hands.
4. A lab supplied Precleaned/Quality Certified 4.0 oz wide mouth jar was used to collect the soil samples thus eliminating contact between the shovel and the actual soil sample.
5. Each sample was sealed with the lab supplied Teflon lined lid and labeled accordingly from WSP1 to WSP10. Gloves were changed between samples to prevent cross contamination.

Results of the sampling are shown in Table 1 below:

Table 1: Source Soil Laboratory Results

Sample #	Arsenic	Lead	Antimony	Zinc
1	6.8	9.4	0.38	54
2	7.7	9.4	0.4	56
3	6.8	9.1	0.36	55
4	9.2	10	0.37	59
5	6.8	8.7	0.33	52
6	6.9	10	0.41	55
7	5.5	8.2	0.30	50
8	6.2	9.0	0.32	55
9	7.7	10	0.39	60
10	7.1	9.5	0.34	54
MTCA Method A/B CUL	**20**	**250**	**5.42**	**5,970**

No onsite sources of crushed rock are present at WSP. Crushed rock will imported from a local quarry for placement and compaction. Crushed rock shall be of 1 ½ inch minus or greater.

4.3 Geotextile Fabric

Construction geotextile roll identification, storage, and handing shall be in conformance with ASTM D4873, including storing the material off the ground, and ensuring the material is protected from ultraviolet radiation, site construction damage, precipitation, chemicals, such as, strong acids or strong basics, flames, temperatures in excess of 160 degrees Fahrenheit, or any other environmental condition that may damage the physical property values of the material.

Geotextile fabric will be placed below all areas specified for compacted crushed rock. Geotextile fabric will consist of a nonwoven, polypropylene fiber manufactured of 4.0 ounce or greater product. Fabric selection shall be compliant with WSDOT Section 9-33.

4.4 Silt Fence

Silt fence shall be placed at down slope locations at both the WSP Landfill and soil borrow location. Selected materials shall comply with WSDOT Section 9.33.2 (1) Geosynthetic Properties, Table 6.

5.0 LANDFILL CONSTRUCTION TASKS

5.1 Work Area Preparation

Both the WSP Landfill and the WSP borrow shall be prepared as provided in Figures 7 and 8 to address Temporary Erosion and Sediment Plan requirements. Generally, this shall consist of placement of silt fencing, construction of rocked construction entrances, and protection of existing facility stormwater conveyances and treatment facilities.

Construction stormwater pollution prevention elements for the Site are provided in the stormwater pollution prevention plan (SWPPP). The SWPPP includes information on: clearing limits, construction access, stabilizing soils, protecting slopes, protecting drain inlets, controlling pollutants, maintaining best management practices (BMPs), and managing the project until completion. A brief summary of some stormwater pollution prevention elements are provided below.

Silt fencing and other sediment control measures will be installed to protect stormwater conveyances. Storm drain inlets operable during construction along Site access routes will be protected so that stormwater runoff does not enter the conveyance system without being filtered or treated to remove sediment.

5.2 Site Access

New quarry spall entrances will be constructed near the southwest corner of the WSP Landfill and at the northeast corner of the borrow soil location. Existing roadways between the borrow soil location and WSP Landfill will be maintained as needed during the relocation of capping soils.

5.3 Grading

The existing landfill consists of an irregular surface and results in localized infiltration of precipitation. To effect even precipitation infiltration, the landfill surface will be graded to a smooth, uniform condition free from ruts, potholes, and protruding objects such as rocks or sticks. Grading shall effect a slope to the north to allow excess precipitation to runoff the cover system.

An approximate 8-feet of elevation change occurs from the south extent of the landfill adjacent the WSP asphalt paved roadway to the north extent of the landfill, a distance of approximate 375 feet. The site has been rough-graded and contoured to provide a minimum slope of 2% and not exceeding 33% on the side slopes.

5.4 Placement of Soil and Fabric/Rock Cap

Prior to placement of the cap, the rough-graded, contoured landfill surface shall be surveyed and staked to ensure the final cover is capable of meeting the minimum 6" soil cap requirements over the landfill surface, following placement of the fabric/crushed rock ecological barrier, and the minimum/maximum soil slope requirements. Figure 9 shows details for the various cap designs being used on the Site.

Fabric will be placed above the surface of portions of the landfill and installed per manufacture's direction. The geotextile shall be spread immediately ahead of the covering operation and shall be placed smooth without excessive wrinkles or folds. The geotextile shall not be exposed to sunlight for more than 14 calendar days. Care shall be taken to prevent damage to the geotextile from site equipment. Construction vehicles shall be limited in size and weight, to reduce rutting in the initial lift above the geotextile.

Rock piles shall be used as needed to hold the geotextile in place until the rock cover is placed. Any areas of damage, such as tears, punctures, or the overlaps or seam joints disturbed the damage shall be repaired

or the material replaced. The repair shall consist of placing a patch to overlap the existing geotextile from the edge of any part of the damaged area by 2 feet.

Approximately 1.8 acres requires placement of geotextile fabric, including areas both capped with relocated soils and with compacted crushed rock. A total of about 8,712 square yards of geotextile fabric, plus necessary quantities for overlapping edges, shall be required.

Rock shall be placed on the geotextile fabric and pushed across the geotextile face ensuing that construction vehicles are on the rock surface at all times. Approximately 1,130 cubic yards or about 2,000 tons of ¾" crushed rock will be required to cover 0.7 acres of the site.

Following placement of fabric/rock barrier, the minimum 6" clean soil cover will be placed to bring final grades to a minimum 2% slope/maximum 33% slope. Approximately 10,000 cubic yards of soil will be used to cap the WSP Landfill.

A survey shall be conducted to confirm that the final cap meets the minimum soil and slope requirements.

5.5 Seeding of Cap

Seeding with native grass mixes will be performed over the final landfill surface, to enhance evapotranspiration and limit the growth of invasive weeds. A native seed mix will be determined in coordination with DOC staff and consultation with the Walla Walla County Conservation District. Manufacturer's direction on planting and maintenance will be followed.

6.0 OTHER CONSTRUCTION TASKS

6.1 Well Decommissioning

Irrigation Well No. 4 will be decommissioned in accordance with WAC 173-160-381 (1) (a) generally described as follows:

- Remove debris and accumulated sediment from the well bore to the extent feasible using an appropriate drilling method. Dispose of removed materials per applicable regulations.
- Survey the well with a downhole video camera to evaluate the condition and depth intervals of the well casing(s).
- Seal the open bedrock borehole (525 feet to 1,004 feet); allow grout to set.
- Perforate and pressure-grout the 16-inch-diameter casing (383 feet to 525 feet).
- Perforate and pressure-grout the 20-inch-diameter casing (290 feet to 383 feet).
- Perforate and pressure-grout the 24-inch-diameter casing (5 feet to 290 feet).
- Seal the upper casing with cement (0 feet to 5 feet).
- Document the coordinates of the well by a licensed surveyor.
- Submit the well decommissioning report to Ecology.

The 14 groundwater monitoring wells will be decommissioned in accordance with Chapter 173-160-381 only after 4 consecutive quarters of groundwater monitoring demonstrating clean and receiving written approval from Ecology.

6.2 Low-Permeability Cap (former Dry Cleaner Building)

Low permeability cap construction will consist of a minimum 6" gravel base and 6" finished concrete surface as shown in Figure 9. This low permeability cap is a change from the 2.5" asphalt concrete pavement directed in the CAP. Stormwater from the concrete surface will be directed to existing stormwater catch basin as shown in Figure 10. No digging below 18" will occur at the site. The estimated 100 cy of soil and concrete surfacing removed during construction will be deposited in the East landfill area and capped with clean soil. Based on the RIFS documentation, concentrations in the surface soils are between 1.6 mg/kg and 12 mg/kg PCE.

7.0 POST-CLEANUP MONITORING ACTIVITIES

Post-cleanup monitoring activities consists of groundwater monitoring and visual inspection of the cleanup covers to detect excessive erosion, settlement, cracking, or other adverse conditions. Should damage be observed, the cover will be repaired as needed.

7.1 Groundwater Monitoring

Groundwater monitoring will be completed on a quarterly schedule for the 14 existing site groundwater monitoring wells. Monitoring will continue at each well until contamination is below MTCA Method B cleanup levels for 4 consecutive quarters at the well or until demonstrated to be statically clean as provided in MTCA. Monitoring for manganese in upgradient wells will be discontinued after 4 consecutive quarters of groundwater monitoring has been completed.

The following onsite monitor wells will be sampled; MW-1, MW-2, MW-3, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14 and MW-15. Samples shall be and analyzed for the following constituents:

- Temperature
- pH
- Manganese
- Tetrachloroethylene
- Conductivity
- Nitrate, nitrite, and ammonia as nitrogen
- Total Chromium/Hexavalent Chromium

Following each quarterly monitoring event, the laboratory results will be presented in a groundwater monitoring report. Laboratory data will be loaded following each event into Ecology's Environmental Information Management database.

7.2 Visual Inspection

Inspection will consist primarily of visual observation of the condition of the landfill cover, concrete cover, vegetation, and existing drainage facilities following the inspection form set forth in the Operations and Maintenance Plan. Inspection will be performed by DOC or assigned environmental consultant during each groundwater monitoring event. In addition, at least once annually DOC's region environmental manager shall complete a visual inspection.

If indications of damage or potential for damage, WSP shall be notified and corrective action completed. If repeated damage occurs, an evaluation of the cause of the damage, such as excessive erosion, shall be completed and improvements beyond simple repair completed. For the cleanup cover, areas of concern include excessive erosion, failure of vegetation, and excessive settlement as indicated by ponding, scarps, or other disruptions of cover geometry.

7.3 Responsible Parties

The agency with primary responsibility for implementing the post-cleanup plan is the

Washington State Department of Corrections
Washington State Penitentiary
Superintendent Donald R. Holbrook
1313 North 13th Street
Walla Walla, Washington

8.0 CLEANUP SCHEDULE

The following cleanup schedule shall guide the project tasks:

Task	Date
Effective date of Order	June 6, 2016
Corrections to submit *Draft* Engineering Design Report, O&M Plan, Compliance Monitoring Plan, and Schedule of Work to be Performed	September 20, 2016
Corrections to submit *Final* Engineering Design Report, O&M Plan, Compliance Monitoring Plan, and Schedule of Work to be Performed	About May 2017
Corrections to begin implementation of remedial action following Schedule of Work to be Performed	About November 20, 2016
Completion of Rough Grading/Concrete Cap	December 15, 2016
Placement of Geosynthetic	May 2017

Transport of Borrow Soils	June 2017
Importation of Crushed Gravel and Placement	May 2017
Placement of Clean Borrow Soils	May and June 2017
Seeding of native soils	June 2017
Removal of TESC	June 2017
Decommissioning of Wells	2017 to 2019 Biennium [1]

[1] *Work schedule is subject to project funding from the Washington State Legislature*

Corrections to submit *Draft* Cleanup Action Report	June 30, 2017
Corrections to submit *Final* Cleanup Action Report	*Following Well Decommissioning*
Corrections to submit a recorded Environmental Covenant	Fall 2017

9.0 REFERENCES

Ecology (Washington State Department of Ecology). 2016. Response to Comments, Draft Cleanup Action Plan, Agreed Order, State Environmental Policy Documents, and Amended Public Participation Plan for the Washington Department of Corrections, Washington State Penitentiary. June 2016.

HWA (HWA Geosciences Inc.). 1998. Preliminary hydrogeologic evaluation-construction demolition landfill, Washington State Penitentiary Walla Walla, Washington. Prepared for the Washington State Department of Corrections. September 3, 1998.

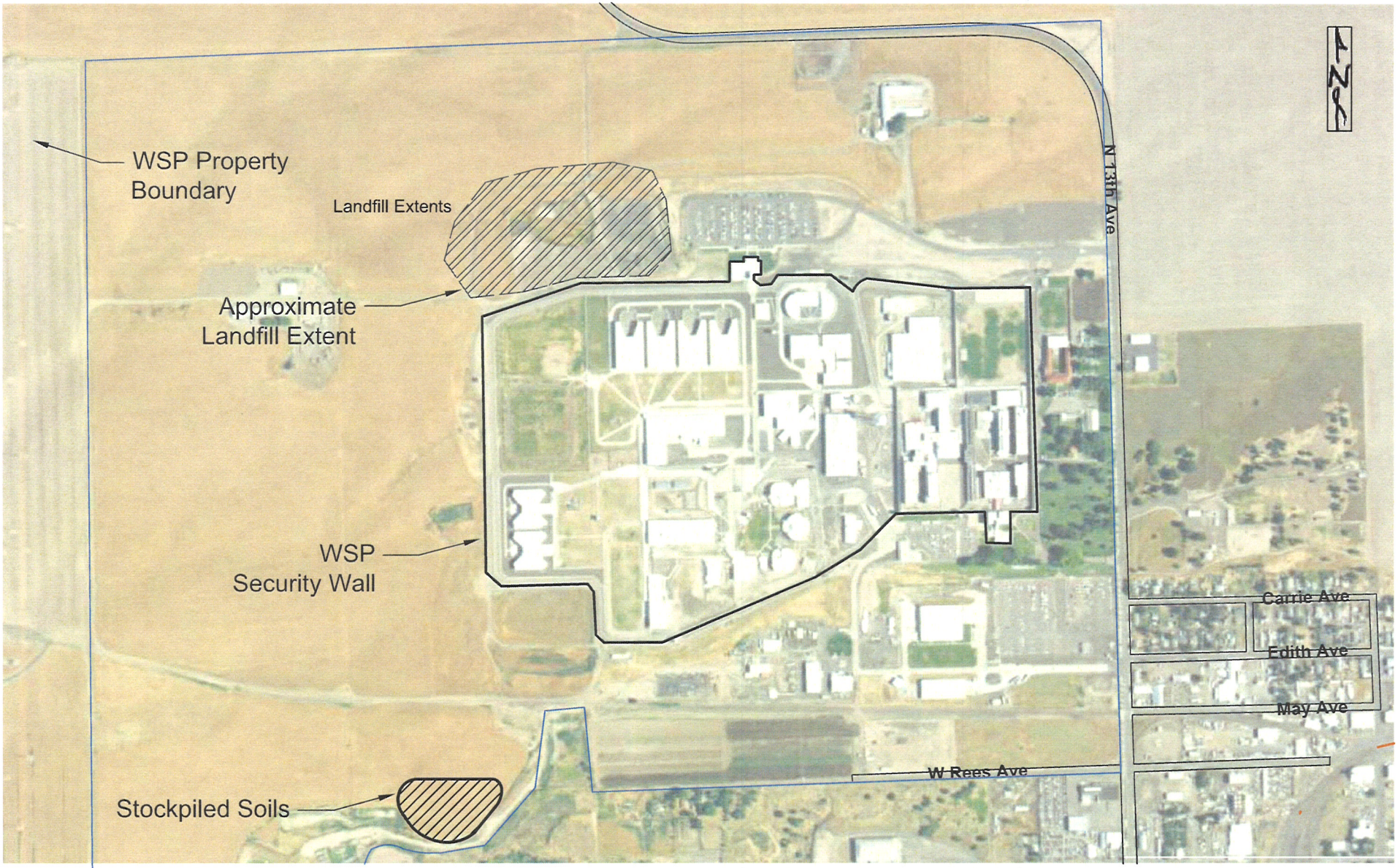
HWA. 2002. Washington State Penitentiary, Phase 2 Soil and Ground Water Investigation, Walla Walla, Washington. Prepared for the Washington State Department of Corrections. June 6, 2002.

Parametrix. 1995. Closed construction/demolition landfill Washington State Penitentiary Walla Walla, WA. Prepared for the Washington State Department of Corrections. June 23, 1995.

Parametrix. 2010. Washington State Penitentiary Walla Walla, WA remedial investigation/feasibility study (RI/FS) final work plan. Prepared for the Washington State Department of Corrections. February 2010.

Parametrix. 2012. Final Remedial Investigation and Feasibility Study (RI/FS) Report, Washington Penitentiary, Walla Walla, Washington. Prepared by Parametrix, Bremerton, Washington. November 2012.

FULCRUM
environmental consulting



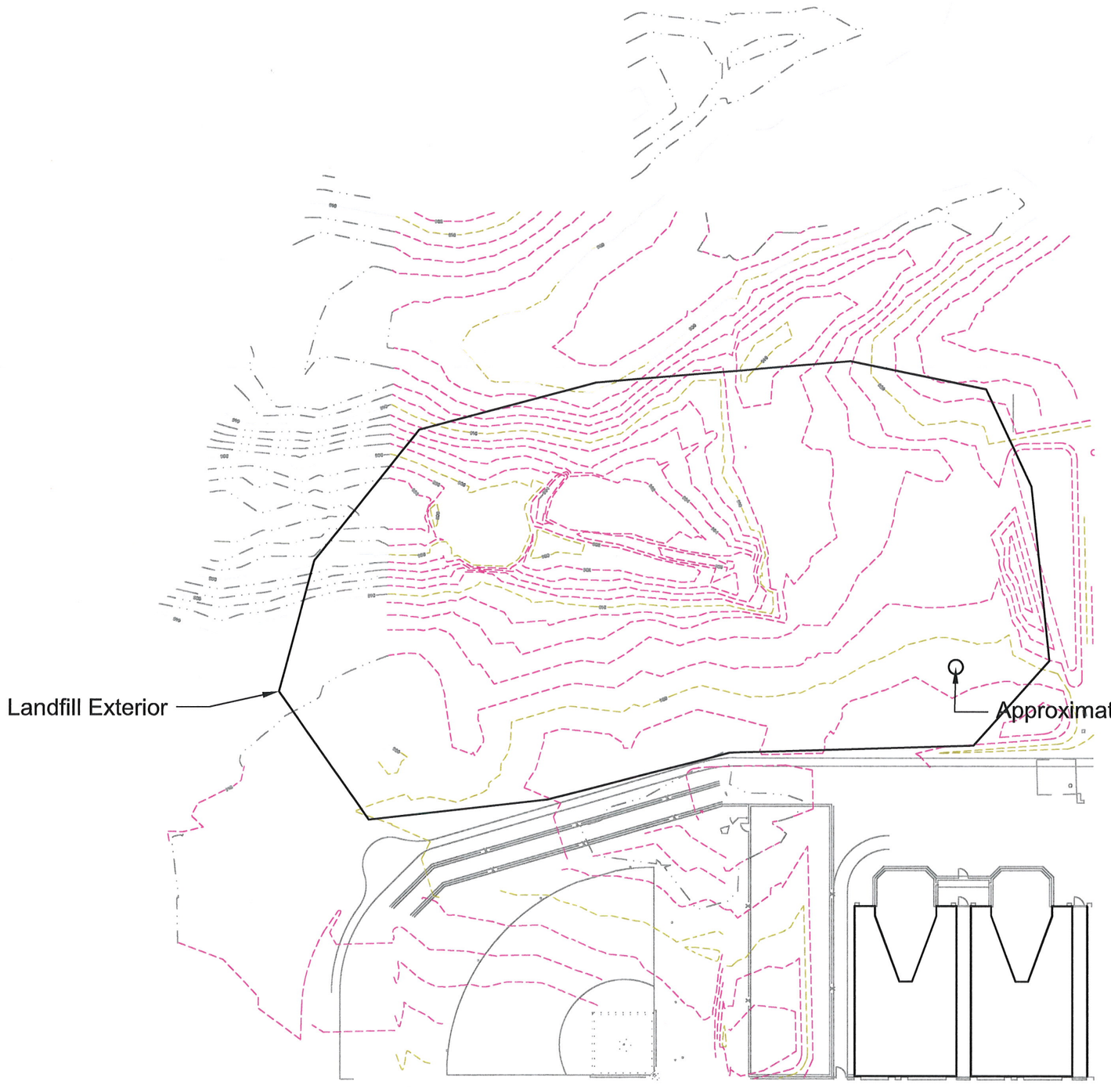
Fulcrum Environmental Consulting, Inc.
406 North Second Street, Yakima, Washington 98901
p: 509.574.0839 f: 509.575.8453 efulcrum.net
WSP COC Landfill Cleanup. 161801. LMW.090216

WSP Landfill
Washington State Penitentiary
Walla Walla, Washington

WSP Boundary and Site Features

FIGURE
2

FULCRUM
environmental consulting



ANC

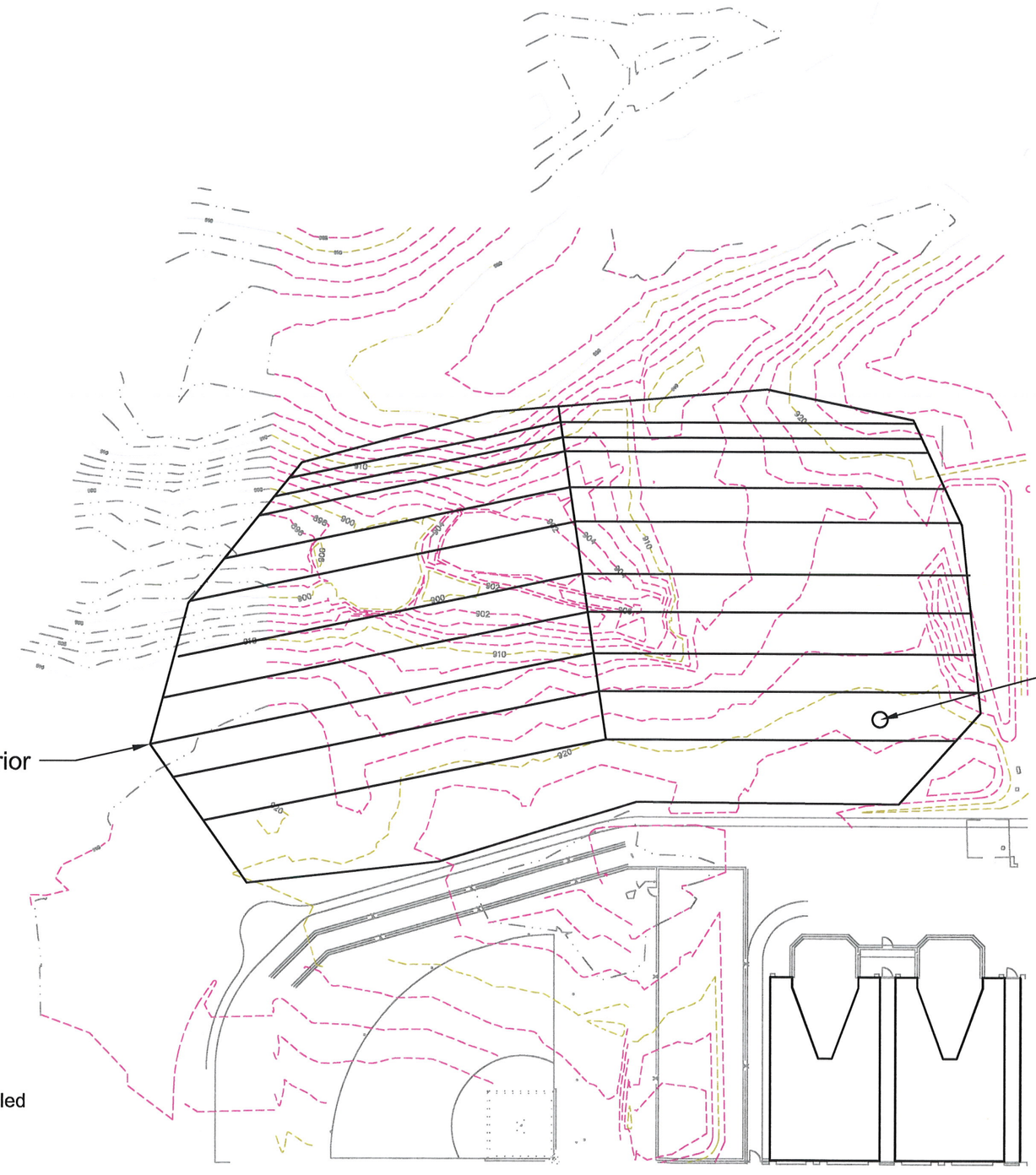
Fulcrum Environmental Consulting, Inc.
406 North Second Street, Yakima, Washington 98901
p: 509.574.0839 f: 509.575.8453 efulcrum.net
WSP COC Landfill Cleanup. 161801. LMW.090216

Washington State Penitentiary
Walla Walla, Washington

Existing Grade

FIGURE
3

FULCRUM
environmental consulting



NOTE:
Pre and post elevations surveys to be performed to verify CAP requirements detailed in Figure 9 are achieved.

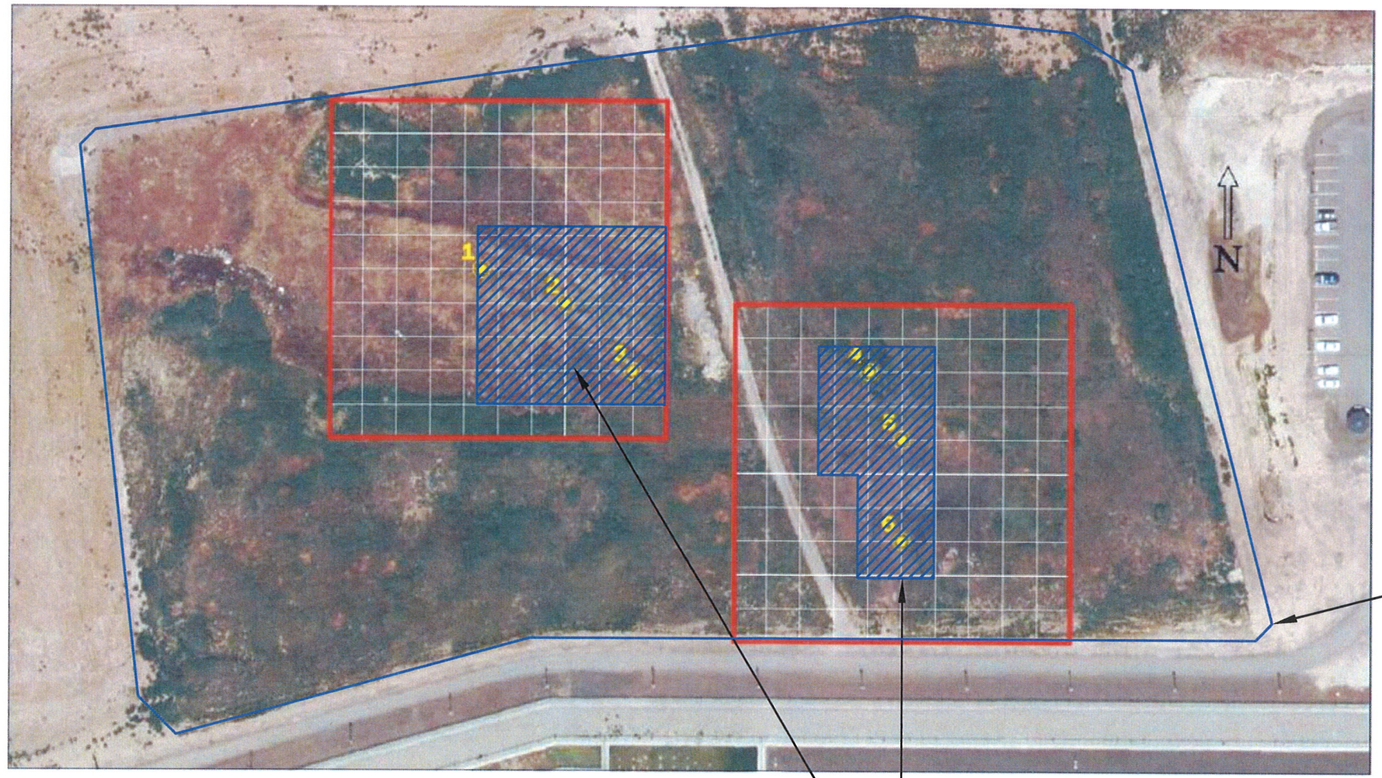
Fulcrum Environmental Consulting, Inc.
406 North Second Street, Yakima, Washington 98901
p: 509.574.0839 f: 509.575.8453 efulcrum.net
WSP COC Landfill Cleanup. 161801. LMW.090216

1313 North 13th Avenue
Walla Walla, Washington

Landfill Elevation

FIGURE
4

FULCRUM
environmental consulting



POINT LOCATIONS:

NUMBER	LATITUDE	LONGITUDE
1	46° 04' 58.644" N	118° 22' 04.699" W
2	46° 04' 58.363" N	118° 22' 03.869" W
3	46° 04' 57.814" N	118° 22' 03.096" W
4	46° 04' 58.350" N	118° 22' 00.277" W
5	46° 04' 57.760" N	118° 21' 59.697" W
6	46° 04' 56.796" N	118° 21' 59.466" W

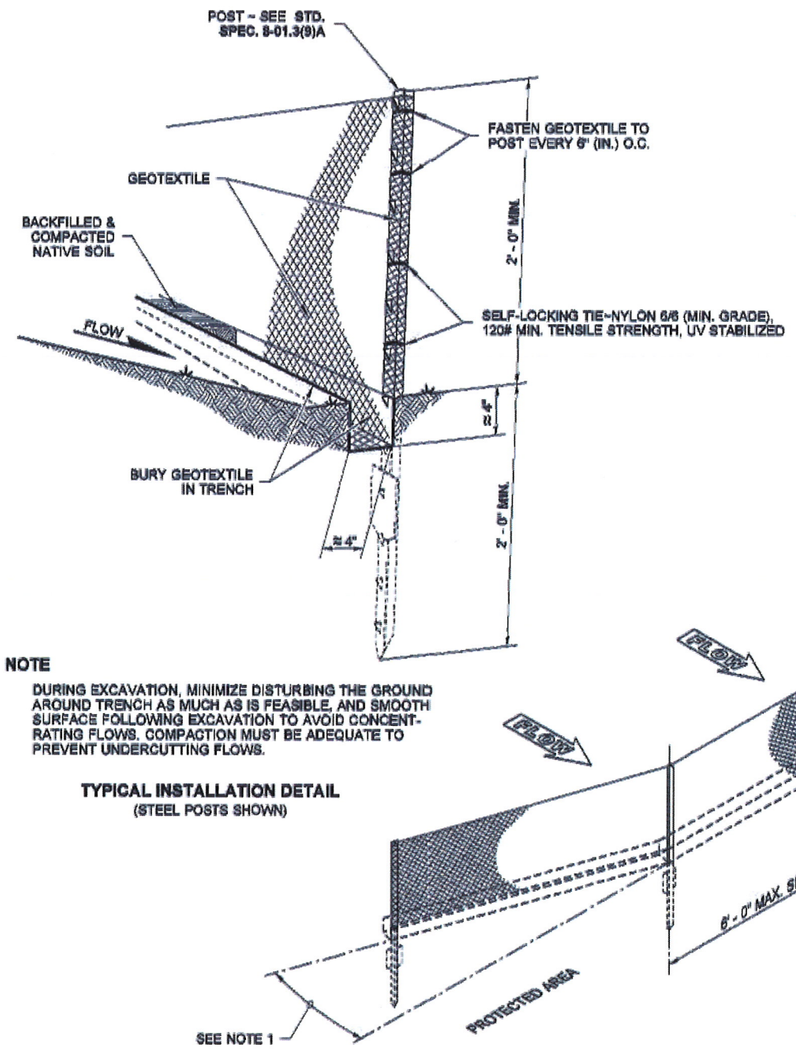
Fulcrum Environmental Consulting, Inc.
406 North Second Street, Yakima, Washington 98901
p: 509.574.0839 f: 509.575.8453 efulcrum.net
WSP COC Landfill Cleanup. 161801. LMW.090216

1313 North 13th Avenue
Walla Walla, Washington

Material Placement &
Geotextile Fabric

FIGURE
5

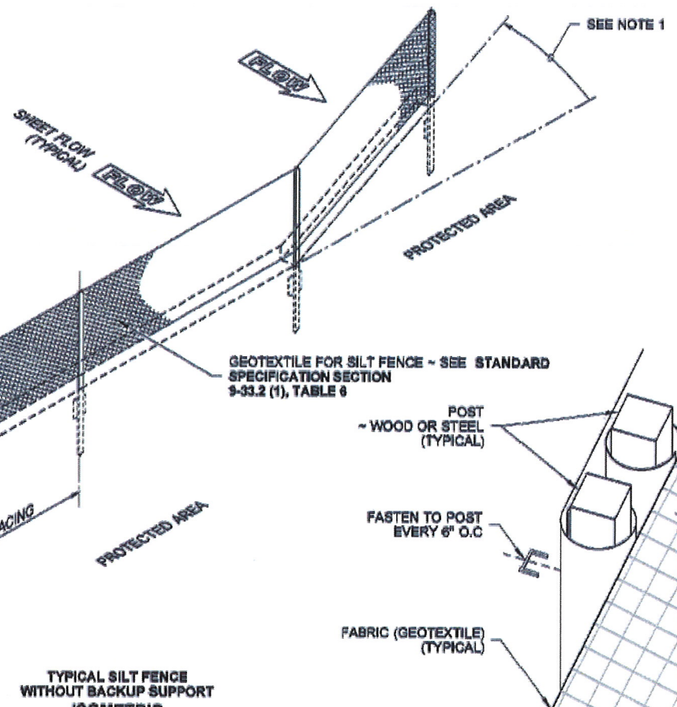
DRAWN BY: BILL BERENS



NOTE

DURING EXCAVATION, MINIMIZE DISTURBING THE GROUND AROUND TRENCH AS MUCH AS IS FEASIBLE, AND SMOOTH SURFACE FOLLOWING EXCAVATION TO AVOID CONCENTRATING FLOWS. COMPACTION MUST BE ADEQUATE TO PREVENT UNDERCUTTING FLOWS.

TYPICAL INSTALLATION DETAIL
(STEEL POSTS SHOWN)



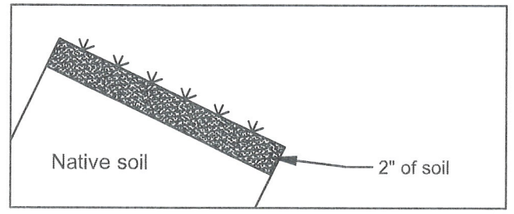
TYPICAL SILT FENCE WITHOUT BACKUP SUPPORT
ISOMETRIC
(STEEL POSTS SHOWN)

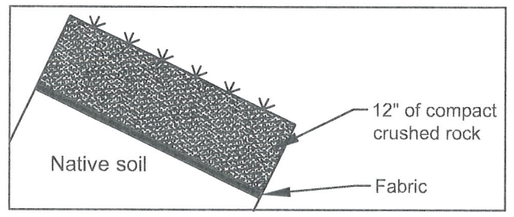
NOTES

1. Install the ends of the silt fence to point slightly upslope to prevent sediment from flowing around the ends of the fence.
2. Perform maintenance in accordance with **Standard Specifications 8-01.3(9)A and 8-01.3(15).**
3. Splices shall never be placed in low spots or sump locations. If splices are located in low or sump areas, the fence may need to be reinstalled unless the Project Engineer approves the installation.
4. Install silt fencing parallel to mapped contour lines.

SPLICED FENCE SECTIONS SHALL BE CLOSE ENOUGH TOGETHER TO PREVENT SILT LADEN WATER FROM ESCAPING THROUGH THE FENCE AT THE OVERLAP.

SPLICE DETAIL
(WOOD POSTS SHOWN)





STATE OF WASHINGTON
REGISTERED
LANDSCAPE ARCHITECT
SANDRA L. SALISBURY
CERTIFICATE NO. 000880

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL, SIGNED BY THE ENGINEER AND APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION. A COPY MAY BE OBTAINED UPON REQUEST.

SILT FENCE

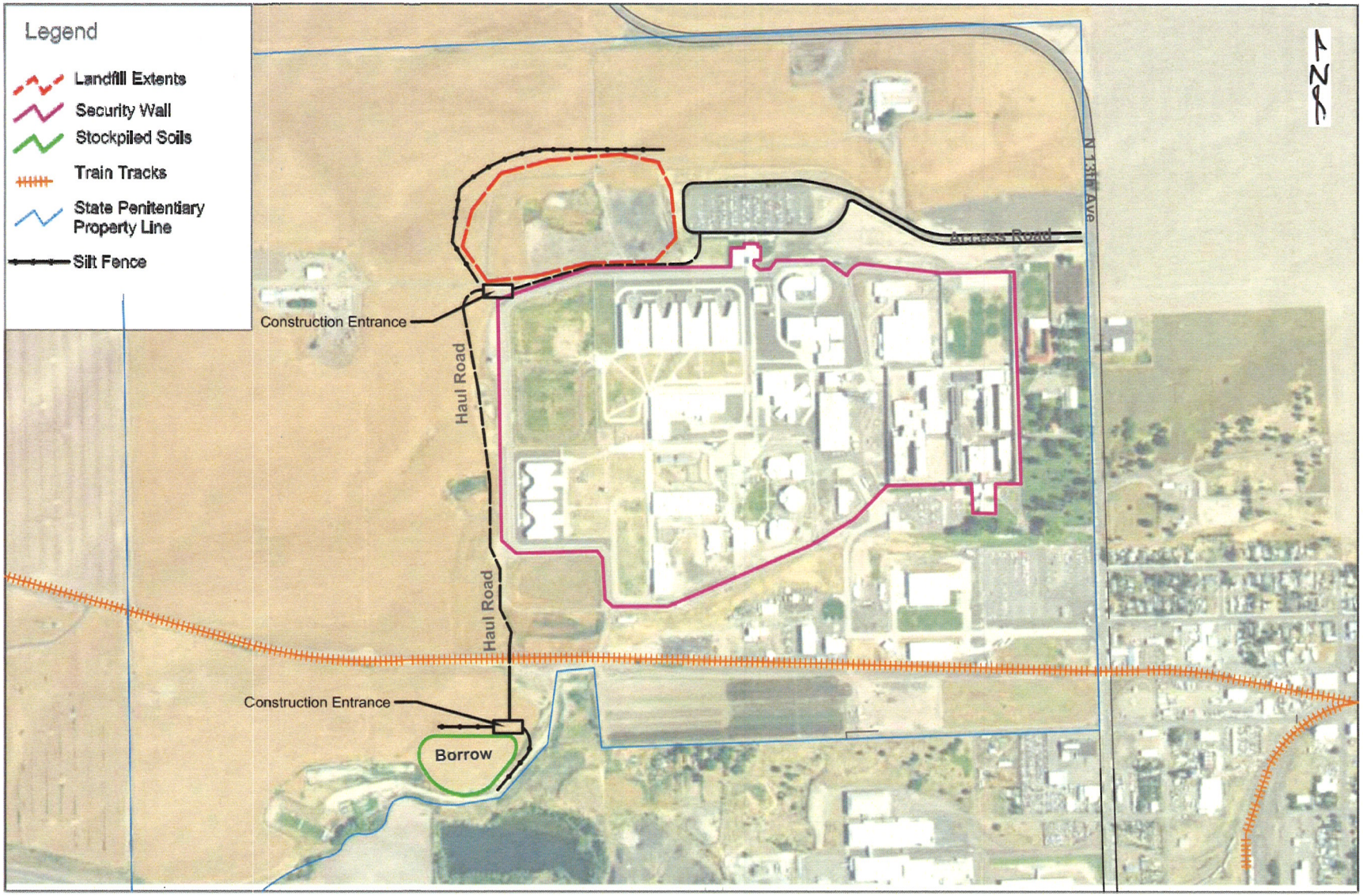
STANDARD PLAN I-30.15-02

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Pasco Bakotich III STATE DESIGN ENGINEER — 3/22/13 DATE
Washington State Department of Transportation

**Drawing provided by Washington Department of Transportation*

FULCRUM environmental consulting



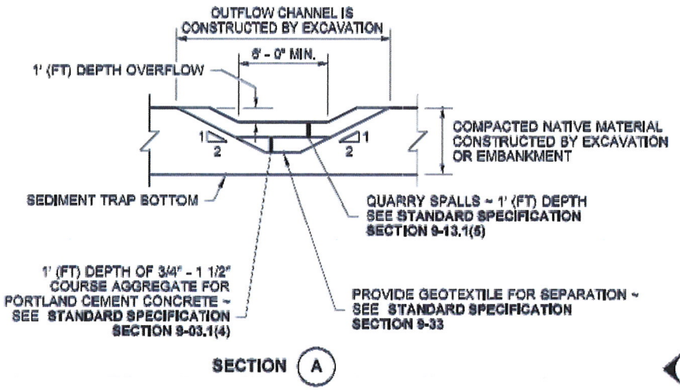
Fulcrum Environmental Consulting, Inc.
406 North Second Street, Yakima, Washington 98901
p: 509.574.0839 f: 509.575.8453 efulcrum.net
LandRII Cleanup 161801 NMB 090216

1313 North 13th Avenue
Walla Walla, Washington

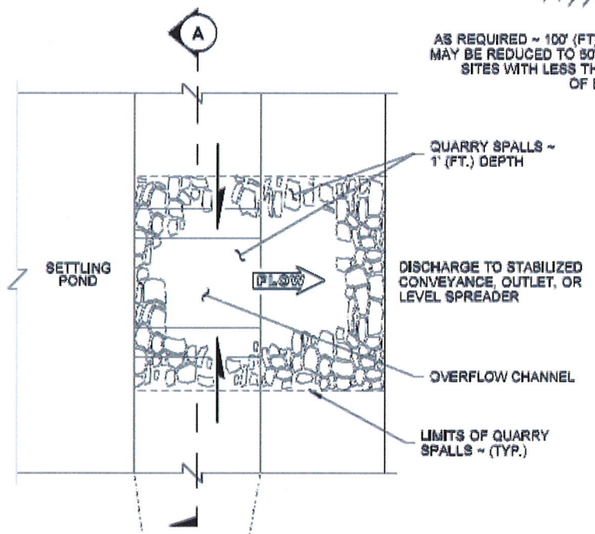
Construction Access Map

Figure
7

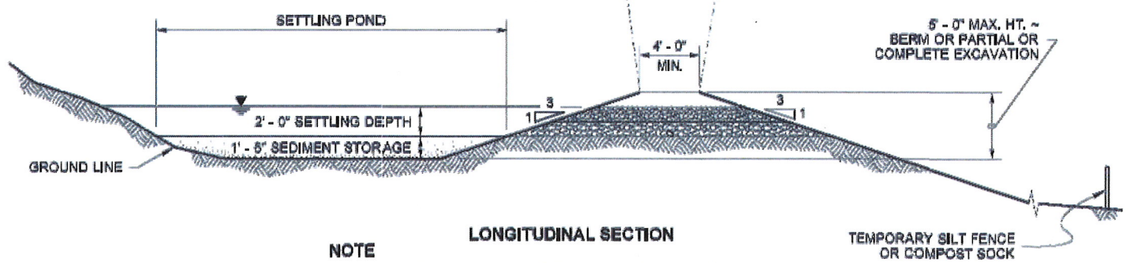
DRAWN BY: FERN LIDDELL



SECTION (A)



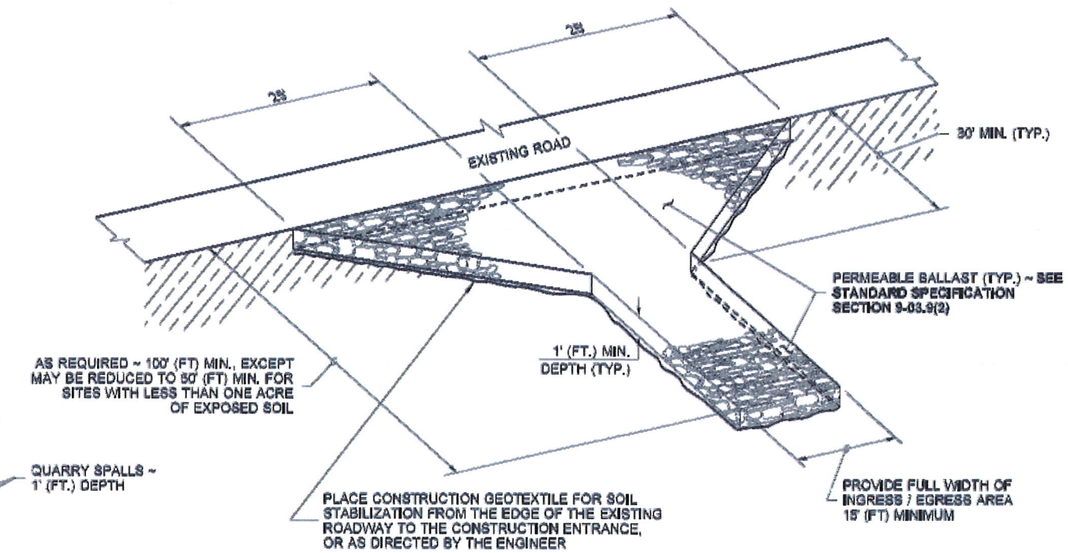
PARTIAL PLAN VIEW OF BERM
SHOWN LARGER FOR CLARITY



LONGITUDINAL SECTION

NOTE
PLACE GEOTEXTILE UNDER THE SPILLWAY AND SIDE SLOPES. PROVIDE A CONTINUOUS LAYER BETWEEN THE GRAVEL/ROCK AND THE NATIVE EARTHEN MATERIAL.

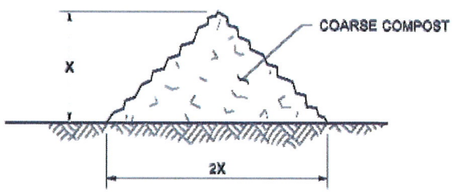
TEMPORARY SEDIMENT TRAP



ISOMETRIC VIEW

STABILIZED CONSTRUCTION ENTRANCE

STABILIZED CONSTRUCTION ENTRANCE SHALL MEET THE REQUIREMENTS OF STANDARD SPECIFICATION SECTION 8-01.3(7).



X = 1' - 0" FOR SLOPES 4H:1V OR FLATTER
X = 1' - 6" FOR SLOPES STEEPER THAN 4H:1V

TYPICAL SECTION

COMPOST BERM DETAIL

STATE OF WASHINGTON
REGISTERED LANDSCAPE ARCHITECT
JULI DEE HARTWIG
LICENSE NO. 1422
DATE: 06-21-17

MISCELLANEOUS EROSION CONTROL DETAILS

STANDARD PLAN I-80.10-02

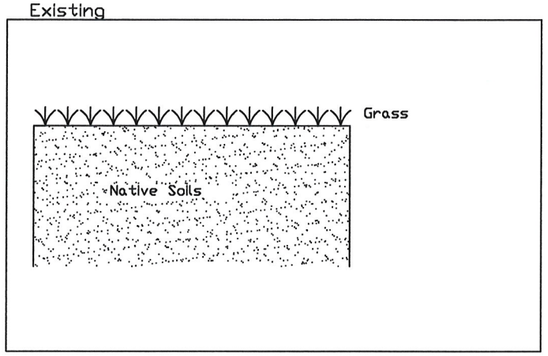
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Carpenter, Jeff
Jul 13 2016 2:28 PM
STATE DESIGN ENGINEER
Washington State Department of Transportation

**Drawing provided by Washington Department of Transportation*

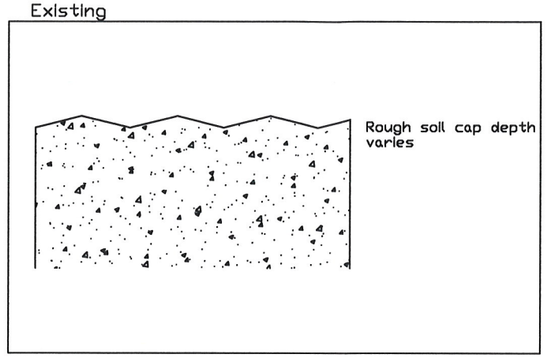
Dry Cleaner

Existing



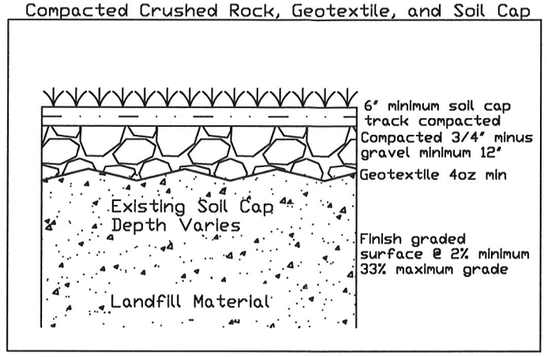
Landfill

Existing



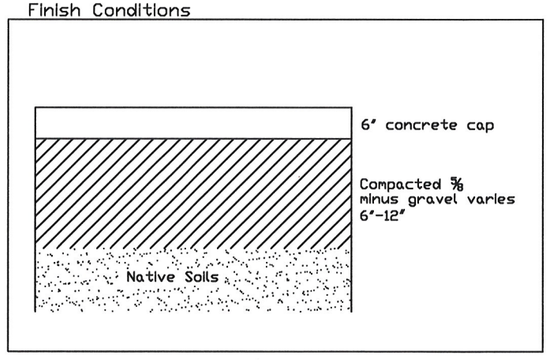
Landfill

Compacted Crushed Rock, Geotextile, and Soil Cap



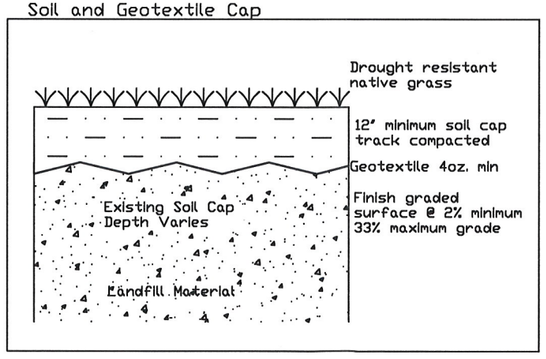
Dry Cleaner

Finish Conditions



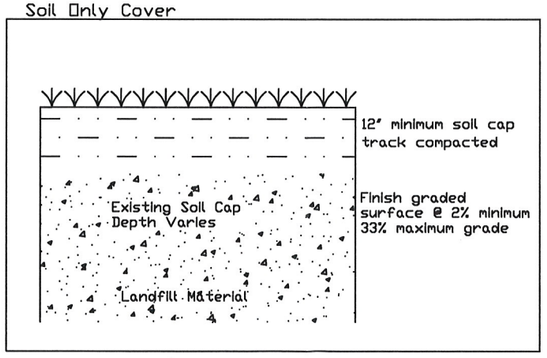
Landfill

Soil and Geotextile Cap



Landfill

Soil Only Cover



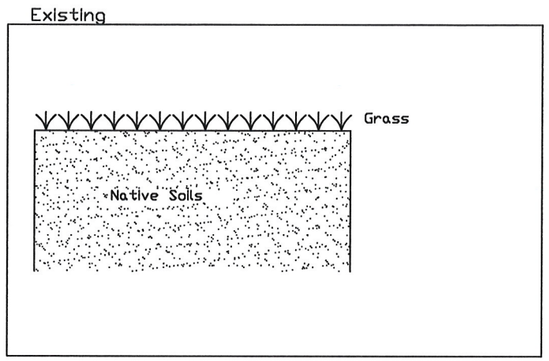
Fulcrum Environmental Consulting, Inc.
406 North Second Street, Yakima, Washington 98901
p: 509.574.0839 f: 509.575.8453 efulcrum.net
WSP COC Landfill Cleanup. 161801. LMW.090216

1313 North 13th Avenue
Walla Walla, Washington

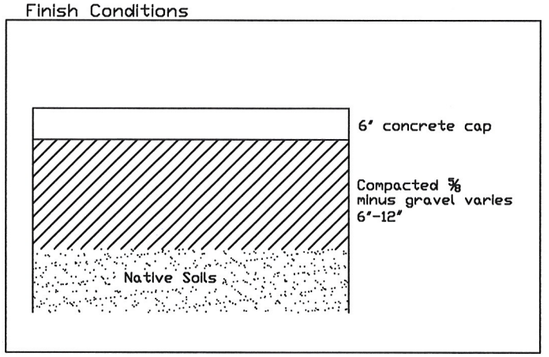
CAP Design Details

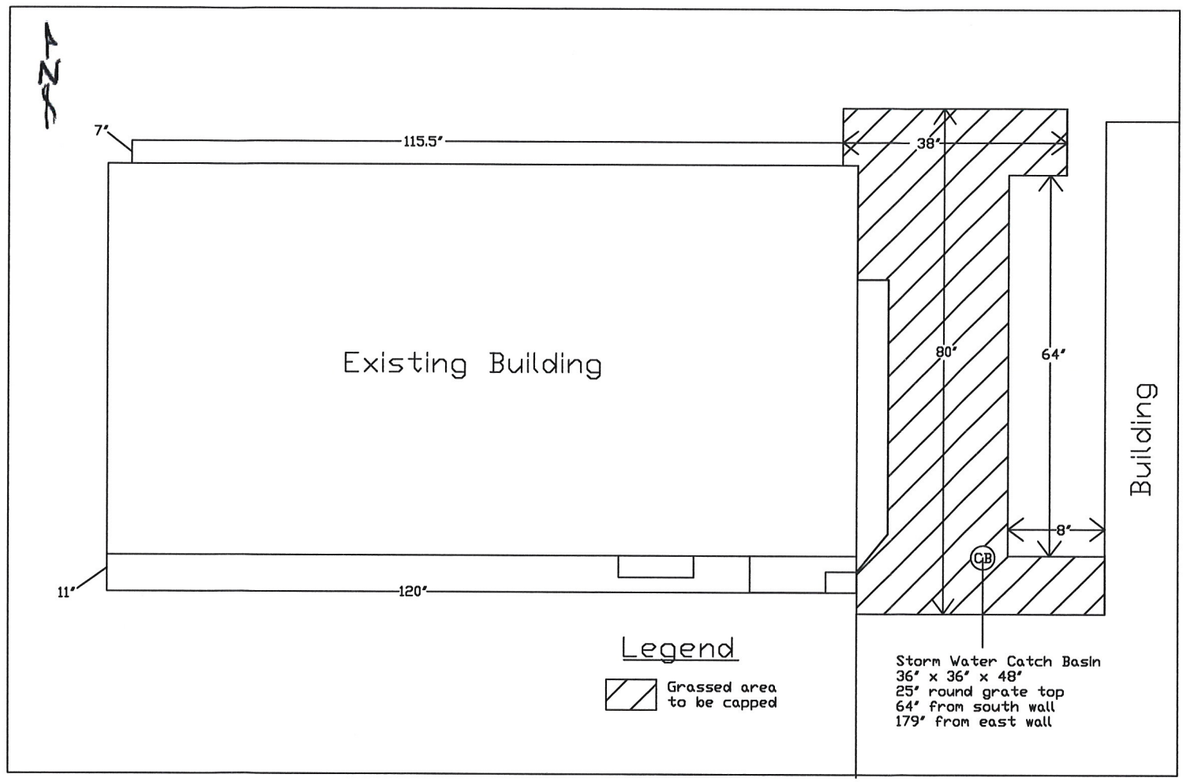
FIGURE
9

Dry Cleaner



Dry Cleaner



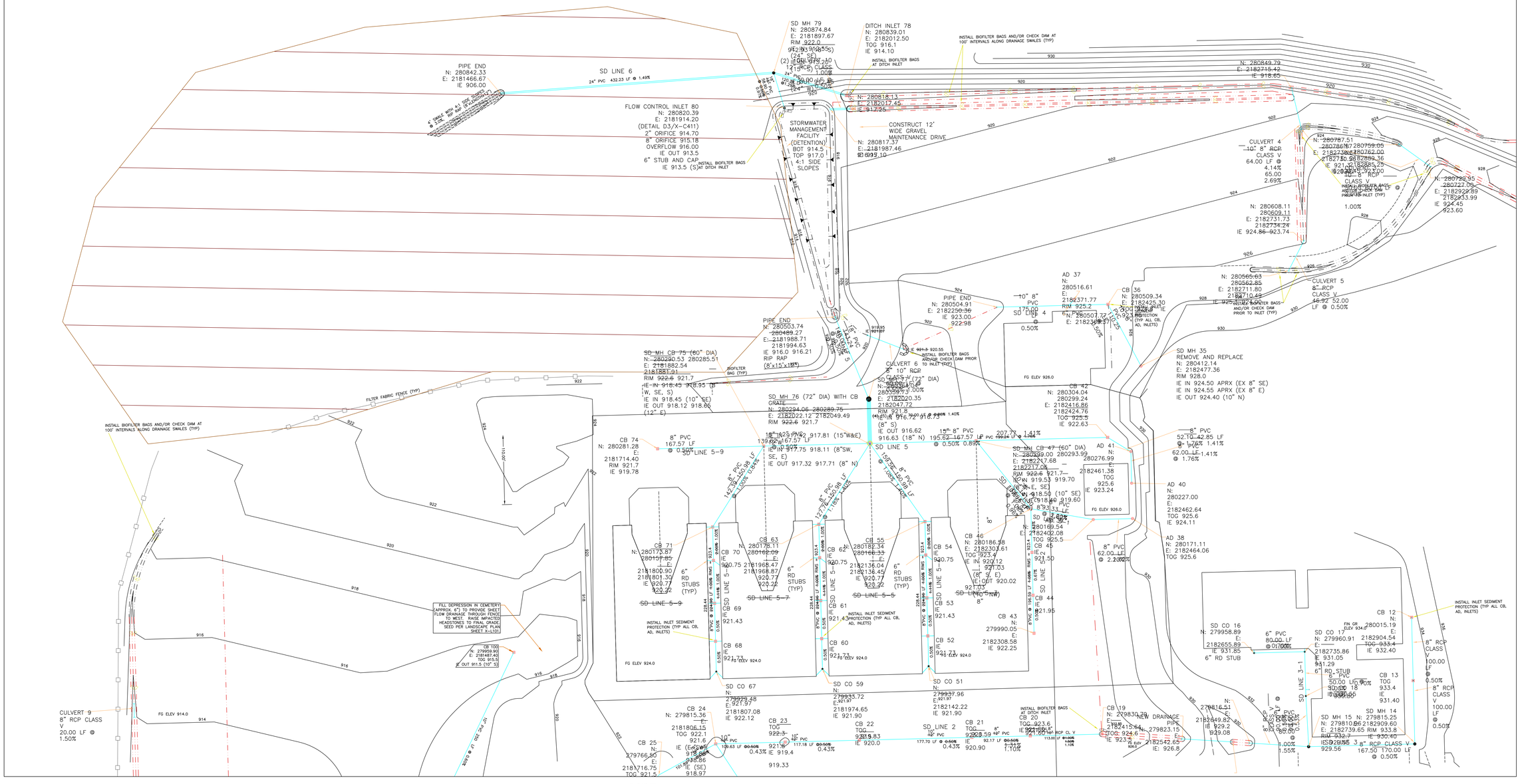


Fulcrum Environmental Consulting, Inc.
406 North Second Street, Yakima, Washington 98901
p: 509.574.0839 f: 509.575.8453 efulcrum.net
WSP COC Landfill Cleanup. 161801. LMW.090216

1313 North 13th Avenue
Walla Walla, Washington

Dry Cleaner CAP Construction

FIGURE
10



FULCRUM
environmental consulting
406 North 2nd Street Yakima, WA 98901
p. 509.574.0839 www.sfulcrum.net

1313 North 13th Avenue

Walla Walla, WA 98926

Date:	5/19/2017
Job No.:	161801.00
Drawn By:	LMW
Checked by:	RKM

Revisions

#	Date	Description

Existing Stormwater Controls (From As-Built Drawings)

Figure 11

APPENDIX 1

Draft Environmental Covenant

After Recording Return
Original Signed Covenant to:
Sandra Treccani
Toxics Cleanup Program
Department of Ecology
4601 N Monroe
Spokane, WA 99205

Environmental Covenant

Grantor: Washington State Department of Corrections
Grantee: State of Washington, Department of Ecology (hereafter "Ecology")
Brief Legal Description: 18-7-36 SW14 TAX1, 13-7-35
Tax Parcel Nos.: 360718430002**,** 350713410003

RECITALS

a. This document is an environmental (restrictive) covenant (hereafter "Covenant") executed pursuant to the Model Toxics Control Act ("MTCA"), chapter 70.105D RCW, and Uniform Environmental Covenants Act ("UECA"), chapter 64.70 RCW.

b. The Property that is the subject of this Covenant is part or all of a site commonly known as WA DOC Washington State Penitentiary, FSID 779. The Property is legally described in Exhibit A, and illustrated in Exhibit B, both of which are attached (hereafter "Property"). If there are differences between these two Exhibits, the legal description in Exhibit A shall prevail.

c. The Property is the subject of remedial action conducted under MTCA. This Covenant is required because residual contamination remains on the Property after completion of remedial actions. Specifically, the following principal contaminants remain on the Property:

d.

Medium	Principal Contaminants Present
Soil	Chromium, lead, tetrachloroethene, benzo(a)pyrene
Groundwater	Nitrate, chromium, manganese, tetrachloroethene

e. It is the purpose of this Covenant to restrict certain activities and uses of the Property to protect human health and the environment and the integrity of remedial actions conducted at the site. Records describing the extent of residual contamination and remedial actions conducted are available through Ecology.

f. This Covenant grants Ecology certain rights under UECA and as specified in this Covenant. As a Holder of this Covenant under UECA, Ecology has an interest in real property, however, this is not an ownership interest which equates to liability under MTCA or the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9601 *et seq.* The rights of Ecology as an "agency" under UECA, other than its' right as a holder, are not an interest in real property.

COVENANT

Washington State Department of Corrections, as Grantor and Fee Simple owner of the Property hereby grants to the Washington State Department of Ecology, and its successors and assignees, the following covenants. Furthermore, it is the intent of the Grantor that such covenants shall supersede any prior interests the GRANTOR has in the property and run with the land and be binding on all current and future owners of any portion of, or interest in, the Property.

Section 1. General Restrictions and Requirements.

The following general restrictions and requirements shall apply to the Property:

a. Interference with Remedial Action. The Grantor shall not engage in any activity on the Property that may impact or interfere with the remedial action and any operation, maintenance, inspection or monitoring of that remedial action without prior written approval from Ecology.

b. Protection of Human Health and the Environment. The Grantor shall not engage in any activity on the Property that may threaten continued protection of human health or the environment without prior written approval from Ecology. This includes, but is not limited to, any activity that results in the release of residual contamination that was contained as a part of the remedial action or that exacerbates or creates a new exposure to residual contamination remaining on the Property.

c. Continued Compliance Required. Grantor shall not convey any interest in any portion of the Property without providing for the continued adequate and complete operation, maintenance and monitoring of remedial actions and continued compliance with this Covenant.

d. Leases. Grantor shall restrict any lease for any portion of the Property to uses and activities consistent with this Covenant and notify all lessees of the restrictions on the use of the Property.

e. Preservation of Reference Monuments. Grantor shall make a good faith effort to preserve any reference monuments and boundary markers used to define the areal extent of coverage of this Covenant. Should a monument or marker be damaged or destroyed, Grantor shall have it replaced by a licensed professional surveyor within 30 days of discovery of the damage or destruction.

Section 2. Specific Prohibitions and Requirements.

In addition to the general restrictions in Section 1 of this Covenant, the following additional specific restrictions and requirements shall apply to the Property.

a. Land Use. The remedial action for the Property is based on a cleanup designed for industrial property. As such, the Property shall be used in perpetuity only for industrial uses, as that term is defined in the rules promulgated under Chapter 70.105D RCW. Prohibited uses on the Property include but are not limited to residential uses, childcare facilities, K-12 public or private schools, parks, grazing of animals, growing of food crops, and non-industrial commercial uses.

b. Containment of Soil/Waste Materials. The remedial action for the Property is based on containing contaminated soil under a two caps: the first consisting of 0.7 acres of geotextile barrier overlain by 12 inches of compacted crushed rock, and the second consisting of 0.1 acres of 2.5 inch thick asphalt and located as illustrated in Exhibit B/C. The primary purpose of these caps is to minimize the potential for contact with contaminated soil and minimize leaching of contaminants to groundwater. As such, the following restrictions shall apply within the area illustrated in Exhibit B/C:

Any activity on the Property that will compromise the integrity of the cap including: drilling; digging; piercing the cap with sampling device, post, stake or similar device; grading; excavation; installation of underground utilities; removal of the cap; or, application of loads in excess of the cap load bearing capacity, is prohibited without prior written approval by Ecology. The Grantor shall report to Ecology within forty-eight (48) hours of the discovery of any damage to the cap. Unless an alternative plan has been approved

by Ecology in writing, the Grantor shall promptly repair the damage and submit a report documenting this work to Ecology within thirty (30) days of completing the repairs.

c. Stormwater facilities. To minimize the potential for mobilization of contaminants remaining in the soil on the Property, no stormwater infiltration facilities or ponds shall be constructed within the area of the Property illustrated in Exhibit B/C. All stormwater catch basins, conveyance systems, and other appurtenances located within this area shall be of water-tight construction.

d. Groundwater use. The groundwater beneath the Property remains contaminated and shall not be extracted for any purpose other than temporary construction dewatering, investigation, monitoring or remediation. Drilling of a well for any water supply purpose is strictly prohibited. Groundwater extracted from the Property for any purpose shall be considered potentially contaminated and any discharge of this water shall be done in accordance with state and federal law.

f. Monitoring. Several groundwater monitoring wells are located on the Property to monitor the performance of the remedial action. The Grantor shall maintain clear access to these devices and protect them from damage. The Grantor shall report to Ecology within forty-eight (48) hours of the discovery of any damage to any monitoring device. Unless Ecology approves of an alternative plan in writing, the Grantor shall promptly repair the damage and submit a report documenting this work to Ecology within thirty (30) days of completing the repairs.

Section 3. Access.

a. The Grantor shall maintain clear access to all remedial action components necessary to construct, operate, inspect, monitor and maintain the remedial action.

b. The Grantor freely and voluntarily grants Ecology and its authorized representatives, upon reasonable notice, the right to enter the Property at reasonable times to evaluate the effectiveness of this Covenant and associated remedial actions, and enforce compliance with this Covenant and those actions, including the right to take samples, inspect any remedial actions conducted on the Property, and to inspect related records.

c. No right of access or use by a third party to any portion of the Property is conveyed by this instrument.

Section 4. Notice Requirements.

a. Conveyance of Any Interest. The Grantor, when conveying any interest within the area of the Property described and illustrated in Exhibit B/C, including but not limited to title, easement, leases, and security or other interests, must:

i. Provide written notice to Ecology of the intended conveyance at least thirty (30) days in advance of the conveyance.

ii. Include in the conveying document a notice in substantially the following form, as well as a complete copy of this Covenant:

NOTICE: THIS PROPERTY IS SUBJECT TO AN ENVIRONMENTAL COVENANT GRANTED TO THE WASHINGTON STATE DEPARTMENT OF ECOLOGY ON [DATE] AND RECORDED WITH THE WALLA WALLA COUNTY AUDITOR UNDER RECORDING NUMBER [RECORDING NUMBER]. USES AND ACTIVITIES ON THIS PROPERTY MUST COMPLY

WITH THAT COVENANT, A COMPLETE COPY OF WHICH IS ATTACHED TO THIS DOCUMENT.

iii. Unless otherwise agreed to in writing by Ecology, provide Ecology with a complete copy of the executed document within thirty (30) days of the date of execution of such document.

b. Reporting Violations. Should the Grantor become aware of any violation of this Covenant, Grantor shall promptly report such violation in writing to Ecology.

c. Emergencies. For any emergency or significant change in site conditions due to Acts of Nature (for example, flood or fire) resulting in a violation of this Covenant, the Grantor is authorized to respond to such an event in accordance with state and federal law. The Grantor must notify Ecology in writing of the event and response actions planned or taken as soon as practical but no later than within 24 hours of the discovery of the event.

d. Notification procedure. Any required written notice, approval, reporting or other communication shall be personally delivered or sent by first class mail to the following persons. Any change in this contact information shall be submitted in writing to all parties to this Covenant. Upon mutual agreement of the parties to this Covenant, an alternative to personal delivery or first class mail, such as e-mail or other electronic means, may be used for these communications.

Eric Heinitz 7345 Linderson Way SW Mailing: PO Box 41112, Olympia 98504-1108 Tumwater, WA 98501 (360) 725-8397	Environmental Covenants Coordinator Washington State Department of Ecology Toxics Cleanup Program P.O. Box 47600 Olympia, WA 98504 – 7600 (360) 407-6000 ToxicsCleanupProgramHQ@ecy.wa.gov

Section 5. Modification or Termination.

a. Grantor must provide written notice and obtain approval from Ecology at least sixty (60) days in advance of any proposed activity or use of the Property in a manner that is inconsistent with this Covenant. For any proposal that is inconsistent with this Covenant and permanently modifies an activity or use restriction at the site:

i. Ecology must issue a public notice and provide an opportunity for the public to comment on the proposal; and

ii. If Ecology approves of the proposal, the Covenant must be amended to reflect the change before the activity or use can proceed.

b. If the conditions at the site requiring a Covenant have changed or no longer exist, then the Grantor may submit a request to Ecology that this Covenant be amended or terminated. Any amendment or termination of this Covenant must follow the procedures in MTCA and UECA and any rules promulgated under these chapters.

c. By signing this agreement, per RCW 64.70.100, the original signatories to this agreement, other than Ecology, agree to waive all rights to sign amendments to and termination of this Covenant.

Section 6. Enforcement and Construction.

a. This Covenant is being freely and voluntarily granted by the Grantor.

b. Within ten (10) days of execution of this Covenant, Grantor shall provide Ecology with an original signed Covenant and proof of recording and a copy of the Covenant and proof of recording to others required by RCW 64.70.070.

c. Ecology shall be entitled to enforce the terms of this Covenant by resort to specific performance or legal process. All remedies available in this Covenant shall be in addition to any and all remedies at law or in equity, including MTCA and UECA. Enforcement of the terms of this Covenant shall be at the discretion of Ecology, and any forbearance, delay or omission to exercise its rights under this Covenant in the event of a breach of any term of this Covenant is not a waiver by Ecology of that term or of any subsequent breach of that term, or any other term in this Covenant, or of any rights of Ecology under this Covenant.

d. The Grantor shall be responsible for all costs associated with implementation of this Covenant. Furthermore, the Grantor, upon request by Ecology, shall be obligated to pay for Ecology's costs to process a request for any modification or termination of this Covenant and any approval required by this Covenant.

e. This Covenant shall be liberally construed to meet the intent of MTCA and UECA.

f. The provisions of this Covenant shall be severable. If any provision in this Covenant or its application to any person or circumstance is held invalid, the remainder of this Covenant or its application to any person or circumstance is not affected and shall continue in full force and effect as though such void provision had not been contained herein.

g. A heading used at the beginning of any section or paragraph or exhibit of this Covenant may be used to aid in the interpretation of that section or paragraph or exhibit but does not override the specific requirements in that section or paragraph.

The undersigned Grantor warrants he/she holds the title to the Property and has authority to execute this Covenant.

EXECUTED this _____ day of _____, 20___.

_____ [SIGNATURE] _____

by: _____ [PRINTED NAME] _____

Title: _____

STATE ACKNOWLEDGMENT

STATE OF _____

COUNTY OF _____

On this day of _, 20__, I certify that _____ personally appeared before me, acknowledged that **he/she** is the _of the state agency that executed the within and foregoing instrument, and signed said instrument by free and voluntary act and deed, for the uses and purposes therein mentioned, and on oath stated that **he/she** was authorized to execute said instrument for said state agency.

_____
Notary Public in and for the State of Washington

Residing at _____

My appointment expires _____

The Department of Ecology**,** hereby accepts the status as GRANTEE and HOLDER of the above Environmental Covenant.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

_____ [SIGNATURE] _____

by: _____ [PRINTED NAME] _____

Title: _____

Dated: _____

STATE ACKNOWLEDGMENT

STATE OF _____

COUNTY OF _____

On this day of _, 20__, I certify that _____ personally appeared before me, acknowledged that **he/she** is the _of the state agency that executed the within and foregoing instrument, and signed said instrument by free and voluntary act and deed, for the uses and purposes therein mentioned, and on oath stated that **he/she** was authorized to execute said instrument for said state agency.

_____
Notary Public in and for the State of Washington

Residing at _____

My appointment expires _____

Exhibit A

LEGAL DESCRIPTION

Parcel 1, located on the northeast portion of the landfill and the former dry cleaner building
Tax Parcel Number: 360718430002
Legal Description: 18-7-36 SW1/4 TAX1

Parcel 2, located on the northwest portion of the landfill
Tax parcel Number: 350713410003
Legal Description: 13-7-35

Exhibit B

PROPERTY MAP

Exhibit C

MAP ILLUSTRATING LOCATION OF RESTRICTIONS

APPENDIX 2

Compliance Monitoring Plan

FULCRUM
environmental consulting

Compliance Monitoring Plan for WSP Landfill Cleanup

Washington State Penitentiary
Walla Walla, Washington

Facility Site 779
Cleanup Site 4971
Agreed Order No. DE 13229

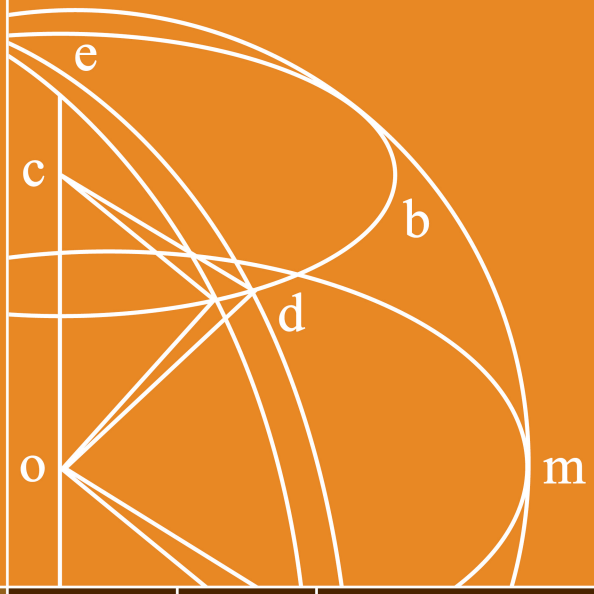
May 16, 2017

Prepared for:

Washington State Department of Corrections
Attn: Donald R. Holbrook, Superintendent,
Washington State Penitentiary
1313 North 13th Street
Walla Walla, Washington 99362

Prepared by:

Fulcrum Environmental Consulting, Inc.
406 North 2nd Street
Yakima, Washington 98901



Acronyms and Abbreviations

BGS	below ground surface
CAP	Cleanup Action Plan
dCAP	draft Cleanup Action Plan
DOC	Washington State Department of Corrections
DES	Washington State Department of Enterprise Services
Ecology	Washington State Department of Ecology
MTCA	WAC 173-340, the Model Toxics Control Act
QPL	Qualified Products List
oz	ounce weight per square foot of material
RI	Remedial Investigation
VOC	Volatile Organic Compounds
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation
WSP	Washington State Penitentiary

Table of Contents

Section — Page

1.0 INTRODUCTION 1

2.0 BACKGROUND 1

3.0 SUMMARY OF CLEANUP ACTION PLAN 3

4.0 COMPLIANCE MONITORING 3
- 4.1 Protection Monitoring 3
- 4.2 Performance Monitoring 3
- 4.3 Confirmation Monitoring 4

5.0 CONCLUSIONS 4

Tables

Table 1 Groundwater Contaminants and Cleanup Levels

Figures

Figure 1 Site Location
Figure 2 WSP Site Boundary

Appendices

Appendix A Health and Safety Plan
Appendix B Operations and Maintenance Plan
Appendix C Sampling and Analysis Plan/Quality Assurance Project Plan

Report Title: Compliance Monitoring Plan

Project Number: 1611801

Date: May 16, 2017

Site: 1313 N. 13 Street, Walla Walla, Washington

Prepared for: Washington State Department of Corrections
Attn: Eric Heinitz
7345 Linderson Way SW
Tumwater, Washington 98501-6504

Prepared by: Fulcrum Environmental Consulting, Inc.
406 North Second Street
Yakima, Washington 98901
509.574.0839

The professionals who completed site services, prepared, and reviewed this report include but are not limited to:

Authored by: Amanda S. Johnson **Date:** 5.16.2017

Amanda Johnson, GIT, Environmental Geologist
Fulcrum Environmental Consulting, Inc.

Reviewed by: Ryan K Mathews **Date:** 5.16.2017

Ryan K. Mathews, CIH, CHMM, Principal
Fulcrum Environmental Consulting, Inc

Report Integrity:

Fulcrum Environmental Consulting, Inc.'s scope of service for this project was limited to those services as established in the proposal, contract, verbal direction, and/or agreement. This report is subject to applicable federal, state, and local regulations governing project-specific conditions and was performed using recognized procedures and standards of the industry. Scientific data collected in situ may document conditions that may be specific to the time and day of service, and subject to change as a result of conditions beyond Fulcrum's control or knowledge. Fulcrum makes no warranties, expressed or implied as to the accuracy or completeness of other's work included herein. Fulcrum has performed these services in accordance with generally accepted environmental science standards of care at the time of the inspection. No warranty, expressed or implied, is made.

1.0 INTRODUCTION

The purpose of this Compliance Monitoring Plan (CMP) is to provide the Washington State Department of Corrections (DOC), the Washington State Department of Ecology (Ecology), and the public with the procedures for complying with the Cleanup Action Plan (CAP) prepared by Ecology for the Washington State Penitentiary (WSP) Landfill Site.

This CMP summarizes the protection monitoring, performance monitoring, and confirmation monitoring that will be performed at the Site. Washington Administrative Code (WAC) 173-340-410, the Model Toxics Control Act (MTCA) specifies the content required for the CMP and provides that the monitoring may be addressed in separate plans or may be combined with other plans or submittals.

This CMP summarizes and cross-references the content requirements that are detailed in the following plans:

1. Health and Safety Plan (HASP): Protection Monitoring
2. Operations & Maintenance Plan (O&M): Performance Monitoring
3. Sampling and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP): Compliance Monitoring

2.0 BACKGROUND

Fulcrum Environmental Consulting, Inc. (Fulcrum) has been retained by the Washington State Department of Corrections (DOC) to create a Compliance Monitoring Plan for use by the Washington State Penitentiary (WSP). The WSP is an active state corrections facility located in the southeastern corner of the state of Washington in the City of Walla Walla. The current address is 1313 North 13 Avenue. The Site consists of the WSP facility, the closed WSP Landfill, and the surrounding undeveloped and agricultural land owned by the State of Washington. The WSP property, including all parcels, structures, and improvements both inside and outside the confined areas, has been expanded numerous times over the years and currently occupies 560 acres.

The Site is situated on the northern slope of the east-west-trending Walla Walla Valley. The valley is gently undulating and of low local relief. The Site elevation generally ranges from 850 to 950 feet above mean sea level with general sloping toward the west (HWA 1998). The facility is located within the SE 1/4 Section 13 and the NE 1/4 Section 24, Township 7 North, Range 35 East, and the SW 1/4 Section 18, and the NW 1/4 Section 19, Township 7 North, Range 36 East, Willamette Meridian in Walla Walla County, Washington.

The Site is bounded on the east by privately-owned land and on the west by the wastewater application section of the Sudbury Road Landfill and several upgradient groundwater monitoring wells owned by Sudbury Road Landfill. State Highway 125 and more privately-owned land bounds the Site on the north (see Figure 1). The Site is bounded on the south by Mill Creek and a drainage pond located on a privately-owned parcel that receives storm water from the WSP and other properties in its vicinity. Properties to the

east and south of the WSP include junkyards and industrial, fuel, and agricultural-chemical facilities. A Burlington Northern Santa Fe Railroad (BNSF) line that serves local industries is located along the southern edge of the property. The City of Walla Walla also bounds the Site on the south. The WSP is topographically and hydraulically upgradient of the Sudbury Road Landfill and downgradient of properties to the east and south (Ecology 2009a).

In 2010, a Remedial Investigation/Feasibility Study (RI/FS) was conducted by Parametrix at the WSP landfill and other areas of concern (AOCs) within the WSP (Parametrix 2012). For groundwater, the constituents of concern (COCs) were identified as trichloroethene (TCE), tetrachloroethene (PCE) and benzo(a)pyrene with concentrations in excess of Ecology's Model Toxics Control Act (MTCA) Method B cleanup levels.

Previous research has established that the WSP Landfill served as the principal disposal site for construction and demolition debris, ash from the penitentiary boiler, and yard and agricultural waste from the associated agricultural production from the early 1970s until 1987 (HWA 1998). In December 1991, Ecology received an anonymous complaint alleging that hazardous substances had been disposed of in the closed WSP Landfill. Materials allegedly dumped were hazardous chemicals, solvents, paints, thinners, and medical wastes. Ecology placed the WSP Landfill on the Confirmed and Suspected Contaminated Sites List in June 1992 following completion of an initial site investigation of the WSP Landfill in March 1992 (Parametrix 1995).

From 1991 through 1998, groundwater monitoring data from samples collected downgradient of the WSP and at the WSP Landfill indicated that concentration levels for volatile organic compounds (VOCs) in the shallow alluvial aquifer sometimes exceeded MTCA Method A standards, and more often exceeded the more stringent Washington State Maximum Contaminant Levels (MCLs) for drinking water. VOCs detected within the groundwater include tetrachloroethylene (PCE) and trichloroethylene (TCE).

Sudbury Road Landfill groundwater monitoring data for 1991 through 1998 indicated that groundwater quality in the shallow aquifer was being impacted by upgradient sources. In 1999, Ecology completed a Contaminant Source Identification/Assessment (CSI/A) study for potential sources of VOCs detected in the upgradient groundwater monitoring wells at Sudbury Road Landfill. The Sudbury Road Landfill is immediately west of, and downgradient of, the WSP. VOCs detected in the Sudbury Road Landfill's upgradient monitoring wells included PCE and TCE (Ecology 1999). The CSI/A study concluded that because contaminant concentrations are generally higher in the upgradient wells and lower in the downgradient wells, the Sudbury Road Landfill was not the suspected source of the VOC contamination (Ecology 2000).

Under Agreed Order No. DE 13229 remediation was completed in 2016 to the WSP Landfill by the improvement of the existing permeable landfill soil cap.

3.0 SUMMARY OF CLEANUP ACTION PLAN

Under Agreed Order No. DE 13229 remediation was completed in 2016 to the WSP Landfill by the improvement of the existing permeable landfill soil cap by re-grading the existing soil and placing additional soil to cover exposed debris, correct surface irregularities, and provide positive drainage. Within a localized portion of the landfill, a geotextile barrier and compacted crushed rock were added to 0.7 acres. A small area (0.1 acre) next to a former dry cleaning facility on site where halogenated VOCs in the soil were identified has been capped with a concrete pad.

4.0 COMPLIANCE MONITORING

Compliance monitoring will be conducted during and following the remedial construction work at the site, in accordance with WAC 173-340-410. The three types of compliance monitoring to be conducted are protection monitoring, performance monitoring, and confirmation monitoring.

- Protection Monitoring to confirm that human health and the environment are adequately protected during the construction period of the interim action;
- Performance Monitoring will be performed to confirm attainment of cleanup levels and other performance standards; and
- Confirmation Monitoring to confirm the long-term effectiveness of the interim action once performance standards have been attained.

4.1 Protection Monitoring

Protection monitoring activities are documented in the health and safety plan (HASP) [Appendix A]. Protection monitoring will address worker health and safety for activities related to construction of the cleanup action, as well as protection of the general public. The HASP addresses potential physical and chemical hazards associated with Site activities consistent with the requirements of WAC 173-340-810, and field monitoring to confirm that potential exposure to chemical hazards do not exceed health-based limits. Anticipated potential physical hazards include working in proximity to heavy equipment, heat stress or cold stress. Anticipated potential chemical hazards include exposure to Site contaminants through various exposure pathways (i.e., direct contact, inhalation, and ingestion). It is anticipated that the health and safety measures implemented to protect worker safely will also adequately protect the general public. Records will be maintained onsite for inspection by Ecology at any time and will be provided, upon request.

4.2 Performance Monitoring

Performance monitoring activities are documented in the Operations and Maintenance Plan [Appendix B]. Performance monitoring for this site requires semi-annual/annual inspections of the landfill and former dry cleaner cover systems. The inspections will document the performance of the cover systems and require corrective actions to be taken to repair any defects. Inspection reports will be maintained onsite for inspection by Ecology at any time and will be provided, upon request, for completion of Ecology's five year periodic reviews.

4.3 Confirmation Monitoring

Confirmation monitoring activities are documented in the Sampling and Analysis Plan [Appendix C]. Long-term confirmation monitoring shall be required because the cleanup action used on-site disposal, isolation, and containment. Such measures shall be required until residual hazardous substance concentrations no longer exceed site cleanup levels.

Confirmation monitoring will include groundwater monitoring to determine concentrations of contaminants of concern. Groundwater monitoring will be completed on a quarterly schedule until four consecutive quarters of groundwater monitoring demonstrate the cleanup levels in groundwater have been achieved. Groundwater sampling from monitoring wells will occur throughout the facility. Sampling will be conducted using established procedures that have been previously used and accepted by Ecology. The sampling protocol and constituents to be analyzed are described in the Sampling and Analysis Plan. The groundwater indicator analytes, respective cleanup levels, and basis documented in the Cleanup Action Plan are:

Table 1: Groundwater Contaminants and Cleanup Levels

GW Indicator Analyte	GW Cleanup Level	Basis
Nitrate	10,000 ug/L	MCL: Drinking Water Standard
Hexavalent Chromium	48 ug/L	MCL: Drinking Water Standard
Manganese	2,240 ug/L	Method B; non-cancer
Tetrachloroethene	5 ug/L	MCL: Drinking Water Standard

Annual groundwater monitoring reports will be submitted to Ecology.

5.0 CONCLUSIONS

The Compliance Monitoring Plan consists of three separate plans, including:

- Health and Safety Plan
- Operations and Maintenance Plan
- Sampling and Analysis Plan/Quality Assurance Project Plan

Each plan performs a role in ensuring and assessing the cleanup action. The CMP provides a short summary of the approaches used for the protection, performance, and compliance monitoring activities being conducted at the Site. More detailed information is included in the appendix under the detailed plans.

Appendix A

Health and Safety Plan

FULCRUM
environmental consulting

Site-Specific Health and Safety Plan Post-Remediation Groundwater Monitoring

Washington State Penitentiary
Walla Walla, Washington
Facility Site 779
Cleanup Site 4971
Agreed Order No. DE 13229

May 16, 2017

Prepared for:

Washington State Department of Corrections
Attention: Eric Heinitz
7345 Linderson Way SW
Tumwater, Washington 98501-6504

Prepared by:

Fulcrum Environmental Consulting, Inc.
406 North Second Street
Yakima, Washington 98901

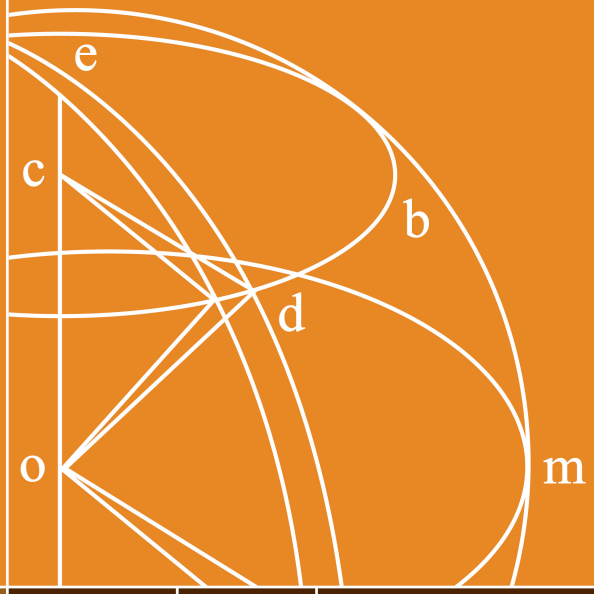


TABLE OF CONTENTS

SECTION PAGE

1.0 APPLICABILITY OF THIS HEALTH AND SAFETY PLAN 1

2.0 GENERAL DESCRIPTION OF PROJECT ACTIVITIES 1
- 2.1 Background 1
- 2.2 Description of Monitoring Well Sampling Activities 2
- 2.3 Site Location and Description 2
- 2.4 Contact List 2
- 2.5 Proposed Schedule 3
- 2.6 Overall Hazard Ranking 3

3.0 GENERAL SITE SAFETY 3

4.0 SITE INFORMATION 4
- 4.1 Site History 4
- 4.2 Planned Duration of Activities 6
- 4.3 General Area of Investigation 6
- 4.4 Site Accessibility 6

5.0 SITE-SPECIFIC SAFETY AND HEALTH HAZARDS 7
- 5.1 Groundwater Sampling 7
- 5.2 Physical Hazards 7
- 5.3 Chemical Hazards 8
  - 5.2.1 Landfill Gases 8
  - 5.2.2 Solvents and Degreasers 8
  - 5.2.3 Other Chemicals and Specialty Chemicals 8

6.0 ENVIRONMENTAL AND PERSONNEL PROTECTION 9
- 6.1 Personal Protection 9
- 6.2 Environmental Delineation 9
- 6.3 Training Requirements 9

7.0 EMERGENCY RESPONSE 9

TABLES

Table 1 Organization of Project Staff and Responsibilities

Report Title: Site-Specific Health and Safety Plan, Post Remediation Groundwater Monitoring

Project Number: 161801.00

Date: May 16, 2017

Site: 1313 North 13 Street, Walla Walls, Washington

Prepared for: Washington State Department of Corrections
Attention: Eric Heinitz
7345 Linderson Way SW
Tumwater, Washington 98501-6504

Prepared by: Fulcrum Environmental Consulting, Inc.
406 North Second Street
Yakima, Washington 98901
509.574.0839

The professionals who completed site services, prepared, and reviewed this report include but are not limited to:

Authored by: Amanda S. Johnson **Date:** 5.16.2017

Amanda S. Johnson, GIT, Environmental Geologist
Fulcrum Environmental Consulting, Inc.

Reviewed by: Ryan K Mathews **Date:** 5.16.2017

Ryan K. Mathews, CIH, CHMM, Principal
Fulcrum Environmental Consulting, Inc.

Report Integrity:

Fulcrum Environmental Consulting, Inc.'s scope of service for this project was limited to those services as established in the proposal, contract, verbal direction, and/or agreement. This report is subject to applicable federal, state, and local regulations governing project-specific conditions and was performed using recognized procedures and standards of the industry. Scientific data collected in situ may document conditions that may be specific to the time and day of service, and subject to change as a result of conditions beyond Fulcrum's control or knowledge. Fulcrum makes no warranties, expressed or implied as to the accuracy or completeness of other's work included herein. Fulcrum has performed these services in accordance with generally accepted environmental science standards of care at the time of the inspection. No warranty, expressed or implied, is made.

Acronym	Definition
°F	degrees Fahrenheit
CFR	Code of Federal Regulations
CSCSL	Confirmed or Suspected Contaminated Sites List
CSI/A	Contaminant Source Identification/Assessment
DOC	Washington State Department of Corrections
GE	General Electric
HSP	Health and Safety Plan
MCL	Maximum Contaminant Level
MSDS	Material Safety Data Sheet
MTCA	Model Toxics Control Act, WAC 173-340
PA	Preliminary Assessment
PCE	Tetrachloroethene
RI/FS	Remedial Investigation/Feasibility Study
TCE	Trichloroethene
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WAC	Washington Administrative Code
WARM	Washington Ranking Method
WSP	Washington State Penitentiary

1.0 APPLICABILITY OF THIS HEALTH AND SAFETY PLAN

Purpose of this site-specific Health and Safety Plan (HSP) is to guide site environmental monitoring activities in a safe manner to prevent injury of persons, structures, property, or the environment. While this HSP has been prepared by Fulcrum Environmental Consulting, Inc. (Fulcrum) it is applicable to all investigators, visitors, and other representatives. Any other HSP prepared or utilized by others at the site shall be at least as stringent as those presented herein.

2.0 GENERAL DESCRIPTION OF PROJECT ACTIVITIES

2.1 Background

In 2010, a Remedial Investigation/Feasibility Study (RI/FS) was conducted by Parametrix at the Washington State Petitionary (WSP) landfill and other areas of concern (AOCs) within the WSP (Parametrix 2012). For groundwater, the constituents of concern (COCs) were identified as trichloroethene (TCE), tetrachloroethene (PCE) and benzo(a)pyrene with concentrations in excess of Ecology's Model Toxics Control Act (MTCA) Method B cleanup levels.

Previous research has established that the WSP Landfill served as the principal disposal site for construction and demolition debris, ash from the penitentiary boiler, and yard and agricultural waste from the associated agricultural production from the early 1970s until 1987. In December 1991, Ecology received an anonymous complaint alleging that hazardous substances had been disposed of in the closed WSP Landfill. Materials allegedly dumped were hazardous chemicals, solvents, paints, thinners, and medical wastes. Ecology placed the WSP Landfill on the Confirmed and Suspected Contaminated Sites List (CSCSL) in June 1992 following completion of an initial site investigation of the WSP Landfill in March 1992.

From 1991 through 1998, groundwater monitoring data from samples collected downgradient of the WSP and at the WSP Landfill indicated that concentration levels for volatile organic compounds (VOCs) in the shallow alluvial aquifer sometimes exceeded MTCA Method A standards, and more often exceeded the more stringent Washington State Maximum Contaminant Levels (MCLs) for drinking water. VOCs detected within the groundwater include TCE and PCE.

Sudbury Road Landfill groundwater monitoring data for 1991 through 1998 indicated that groundwater quality in the shallow aquifer was being impacted by upgradient sources. In 1999, Ecology completed a Contaminant Source Identification/Assessment (CSI/A) study for potential sources of VOCs detected in the upgradient groundwater monitoring wells at Sudbury Road Landfill. The Sudbury Road Landfill is immediately west of, and downgradient of, the WSP. VOCs detected in the Sudbury Road Landfill's upgradient monitoring wells included TCE and PCE. The CSI/A study concluded that because contaminant concentrations are generally higher in the upgradient wells and lower in the downgradient wells, the Sudbury Road Landfill was not the suspected source of the VOC contamination.

Under Agreed Order No. DE 13229 remediation at the WSP Landfill consists by the improvement of the existing permeable landfill soil cap by re-grading the existing soil and placing additional soil to cover

exposed debris, correct surface irregularities, and provide positive drainage. Within a localized portion of the landfill, a geotextile barrier and compacted crushed rock were placed to 0.7 acres. A small area (0.1 acre) next to a former dry cleaning facility on site where PCE in the soil were identified was also excavated, backfilled and capped with a concrete pad.

2.2 Description of Monitoring Well Sampling Activities

Quarterly groundwater monitoring will be performed of monitoring wells on and off site to document the effectiveness of remediation activities. The purpose, intent, and approach of the quarterly monitoring activities are presented in the project *Sampling and Analysis Plan/Quality Assurance Project Plan*, November 10, 2016.

2.3 Site Location and Description

The site is a Washington State Penitentiary (WSP) facility located at 1313 North 13 Street in Walla Walla, Washington (Site). The WSP facility consist of both the WSP inmate managed area and surrounding undeveloped and agricultural land owned by the State of Washington. The WSP property, includes all parcels, structures, and improvements both inside and outside the confined areas and occupies 560 acres.

The Site is situated on the northern slope of the east-west-trending Walla Walla Valley. The valley is gently undulating and of low local relief. The Site elevation generally ranges from 850 to 950 feet above mean sea level with ground topography sloping toward the west.

The Site is bounded on the east by privately-owned land and on the west by the wastewater application section of the Sudbury Road Landfill and several groundwater monitoring wells owned by Sudbury Road Landfill and lying upgradient of the Sudbury Road Landfill. State Highway 125 and additional privately-owned land bounds the Site on the north. The Site is bounded on the south by Mill Creek and a drainage pond located on a privately-owned parcel that receives storm water from the WSP and other properties in its vicinity. Properties to the east and south of the WSP include junkyards and industrial, fuel, and agricultural-chemical facilities. A Burlington Northern Santa Fe railroad line that serves local industries is located along the southern edge of the property. The WSP is topographically and hydraulically upgradient of the Sudbury Road Landfill and downgradient of properties to the east and south.

2.4 Contact List

Table 1 lists the people involved in this project, their respective organization, and their role.

Table 1: Organization of Project Staff and Responsibilities

Person/Agency or Firm	Role/Responsibility
Eric Heinitz Washington State Dept. of Corrections efheinitz@doc1.wa.gov 360.407.8778	DOC property coordinator.
Sandra Treccani Washington State Dept. of Ecology SATR461@ecy.wa.gov 509.329.3412	Ecology project coordinator.
Ryan Mathews, CIH, CHMM, Principal Fulcrum Environmental Consulting, Inc. rmathews@efulcrum.net 509.728.2424	Fulcrum's safety manager for the project.
Travis Trent, PG, LHG, Hydrogeologist Fulcrum Environmental Consulting, Inc. ttrent@efulcrum.net 509.993.4739	Project technical lead.
Nathan Bostrom, Geologist Fulcrum Environmental Consulting, Inc. nbostrom@efulcrum.net 509.594.9395	Site sampler under the direction of Mr. Trent
Mike Ridgeway, Project Manager Fremont Analytical, Inc. mridgeway@fremontanalytical.com 206.352.3790	Responsible for completion of analytical laboratory work tasks, including laboratory analysis, sample container provision, laboratory QA/QC, and review of laboratory analysis results.

2.5 Proposed Schedule

Quarterly groundwater monitoring (four times per year).

2.6 Overall Hazard Ranking

Low

The Site is located on secured, publically owned but limited access property and has limited onsite hazards. Potential hazards from surrounding properties are not present at subject site.

3.0 GENERAL SITE SAFETY

All work shall be performed in compliance with Title 29 of the Code of Federal Regulations (CFR), Part 1910 (29 CFR, General Industry Standards), *Occupational Safety and Health Standards*; 29 CFR 1926, *Safety and Health Regulations For Construction*; Washington Administrative Code (WAC) 296-24, *General Safety and Health Standards*; WAC 296-62, *General Occupational Health Standards*; WAC 296-155, *Safety Standards for Construction Work*; WAC 296-800 *Safety and Health Core Rules* and other applicable federal, state, and local Health and Safety Laws.

In addition, all personnel will not jeopardize the health and safety of themselves or others, or any property, during the course of this investigation.

During onsite operations, each person will be responsible for their own safety. If at any time a site attendant identifies a concern he/she shall alert the Site Safety and Health Officer and request a stoppage of site activities until a review of the situation can be completed.

4.0 SITE INFORMATION

4.1 Site History

Previous investigations conducted in the vicinity of the WSP and Sudbury Road landfills are briefly summarized below. Surface soil, subsurface soil, surface water, and groundwater samples have been collected and analyzed from locations in and around the WSP during previous investigations conducted over about 20 years. Groundwater samples have also been collected in and upgradient of the Sudbury Road Landfill.

The results of previous investigations indicate the following:

PCBs

In 1984, General Electric Company (GE) prepared a polychlorinated biphenyls (PCB) Regulatory Compliance Report. GE conducted a site-wide search of all PCB and non-PCB facilities and inspected all PCB transformers at the WSP. A total of 92 transformers plus oil-filled circuit breakers and oil-filled disconnects were inspected. Two transformers filled with insulating oil (potentially containing PCBs) were found to be leaking.

Chemical Dumping

In March 1992, Ecology conducted an Initial Investigation at the Washington State Penitentiary due to anonymous complaints of onsite chemical dumping. As part of the Initial Investigation, multiple letters were sent to former employees of WSP, the Walla Walla County Health department, and the contractor used during the closure of the WSP Landfill in order to gather further information. All respondents of this letter claimed to have no knowledge of any inappropriate dumping at the WSP Landfill. Because no evidence was found to support these claims, the Initial Investigation determined that the site needed to be carried forward in the MTCA process.

Ecology Site Hazard Assessment

A Site Hazard Assessment was conducted by SAIC in April 1995 in order to gather information on past and present waste management activities and other site-specific environmental data. This assessment was conducted in order to score the site following the Washington Ranking Method (WARM) Scoring Manual

guidelines. The overall ranking given to the WSP Landfill after the field site hazard assessment was "3" on scale of 1 to 5, with 1 being the highest risk.

Landfill Site Assessment

In 1995, Parametrix, Inc., performed a Site Assessment concluding that the WSP Landfill did not present an imminent threat to human health or the environment that required immediate remedial actions. However, the assessment also concluded that there was insufficient information to rule out or confirm the possibility that contaminants might have been buried in the WSP Landfill.

Diesel Underground Storage Tanks

In 1996, DOC decommissioned and removed seven USTs from the WSP facility. Over a period of 8 months, six 500-gallon USTs and one 1,000-gallon UST containing diesel were decommissioned. All seven USTs were used to supply diesel for several emergency generators on-site. Total petroleum hydrocarbons in the diesel range were detected in some of the UST excavations, but none of the results exceeded current MTCA soil cleanup levels. Additional soil was excavated at the one site where levels exceeded the cleanup levels in effect at the time and the final sample results were non-detect.

Landfill Hydrogeologic Evaluation

In 1998, HWA Geosciences, Inc., (HWA) performed a hydrogeologic evaluation and evaluated surface water and groundwater quality of the closed WSP Landfill. HWA installed four groundwater monitoring wells. Groundwater samples were collected from the Sudbury Road Landfill and the newly installed monitoring wells. In some samples the select analytes exceeded MTCA Method A Cleanup Levels or Washington State MCLs, including total dissolved solids, iron, manganese, nitrate-nitrogen, TCE, and PCE. Arsenic, benzene, chloroform, chromium, copper, lead, manganese, and toluene were also detected in the samples but at levels below regulatory concern.

Contaminant Source Identification/Assessment

In 1999, Ecology completed a Contaminant Source Identification/Assessment (CSI/A) study for potential sources of VOCs detected in the upgradient groundwater monitoring wells at Sudbury Road Landfill. The CSI/A was conducted under a Site Assessment Cooperative Agreement between Ecology and the Environmental Protection Agency (EPA). The CSI/A study included a review of Sudbury Road Landfill groundwater monitoring data for 1991 through 1998. Available groundwater data indicated that groundwater quality in the shallow aquifer was being impacted by upgradient sources. Recommendations made at the conclusion of this study included the execution of a Preliminary Assessment (PA) that focused on the WSP Landfill while also evaluating past and present prison institutional operations.

Landfill Preliminary Assessment

In 2000, Ecology released a PA report that included additional research and a file review. One of the conclusions from the PA was that the shallow sedimentary aquifer had been impacted by VOCs and the WSP Landfill has been assessed as a high potential source of the contamination.

Fuel Oil Underground Storage Tanks

Two additional USTs were found in July 2009 during construction activities at WSP. Based on visual observations during the removal, the tanks are thought to have contained fuel oil. One tank was estimated to be approximately 500 gallons while the second tank was estimated to be approximately 1,000 gallons. Post-closure soil sample results were below applicable soil screening levels. Approximately 62 cubic yards of soil were disposed at the Finley Buttes Landfill in Boardman, Oregon. The remaining excavated soils were bioremediated through onsite land-farming in accordance with Ecology requirements and were finally used as fill material for road construction activities at WSP.

4.2 Planned Duration of Activities

It is anticipated that groundwater monitoring activities will require approximately 2 days of onsite work.

4.3 General Area of Investigation

Groundwater monitoring activities will be completed within the following areas:

- WSP Landfill
- Areas surrounding the WSP
- Wells downgradient of WSP and upgradient of the Sudbury Road Landfill

Groundwater monitoring activities will be performed at select groundwater monitoring wells.

4.4 Site Accessibility

As provided in the Agreed Order, Ecology or any Ecology authorized representative shall give reasonable advance notice before entering any area of the Site outside the secure perimeter of the Penitentiary controlled by DOC, unless an emergency prevents such notice.

Groundwater monitoring wells located within the secured area will be sampled during each monitoring event. Access into the secured area shall be coordinated a minimum of 7 days prior to the event, and more appropriately not less than 2 weeks. At all times while within the secured area, staff shall be escorted and under the care of DOC staff. Staff shall not take into the WSP any tools or equipment that are not authorized by DOC and staff shall be subject to inspection when inside the fence.

5.0 SITE-SPECIFIC SAFETY AND HEALTH HAZARDS

5.1 Groundwater Sampling

Hazards encountered during groundwater sampling include the following:

- Back strain due to lifting bailers, pumps, etc. from down-well depths and moving equipment (compressors, generators, etc.) to well locations
- Sound exposure from compressors, generators, etc.
- Electrical hazards associated with use of electrical equipment around water or wet surfaces
- Broken glass from sampling containers
- Exposure to vapors of volatile organics when the well head is initial opened
- Adsorption of toxic chemicals from purged water
- Possible water splashing into eyes or mouth during sampling

The following shall be considered to prevent the hazards present during groundwater sampling:

- To minimize exposure to volatiles when the well head is initially opened, a monitoring instrument (4-gas analyzer, monitoring hydrogen sulfide, lower explosive limit, oxygen, and broad-band toxics sensor) should be placed near the opening to monitor organic levels. The breathing zone should also be monitored. The action levels on the instruments should be chosen before site work begins, and should be outlined in the safety plan.
- To prevent contact with leachate-contaminated ground water, gloves are worn by all personnel.
- Back strain can be prevented by employing proper lifting and bailing techniques. Heavy equipment, such as pumps and generators, should by only lifted with the legs, preferably using two or three personnel.
- Ground fault interrupter should be used in the absence of properly grounded circuitry or when pumps are used around wet conditions.
- Electrical extension cords should be protected or guarded from damage (i.e., cuts from other machinery) and be maintained in good condition.
- Eye protection should be worn as appropriate to prevent water splashing into eyes.

5.2 Physical Hazards

Workers engaged in strenuous activities are prone to illness due to environmental exposures such as heat or cold. During periods of cold weather, personnel should take measures to prevent hypothermia and frost bite. Layering clothing enables personnel to adjust to changing environmental temperatures and exertion generated body heat. Additionally, the presence of wind can increase the risk of cold exposure. Whenever feasible, site personnel will seek shelter from the wind, such as in a building or vehicle, during rest periods.

The possibility of heat related illnesses are increased when protective clothing is donned. Site personnel are encouraged to drink at least 16 ounces of water before work and at least 8 ounces of water/hour throughout

the day. This interval should be decreased to every 30 minutes if temperatures are above 82 degrees Fahrenheit (°F), and to every 15 minutes for temperatures above 90 °F. Also, personnel should rest in a cool area after drinking water to allow body temperature to cool down. All site personnel be aware of the various symptoms and treatments of heat exposure.

Physical hazards present at nearly every site includes uneven working surfaces. While none of the project tasks are anticipated to require work from a platform, elevated surface, or ladder, even uneven ground presents a fall hazard. Care should be taken to review the area surrounding the monitoring well for uneven surfaces, including rocks, depressions, and other features. Slipping on wet surfaces can be prevented by placing all purged water in drums for removal. Also, if the area is wet wear boots with good treads and be alert of where personnel are walking to decrease the chance of slipping.

5.3 Chemical Hazards

Identified chemical hazards include landfill gases; solvents and degreasers; and other chemicals and specialty chemicals. The hazards may be identified in low concentrations in groundwater monitoring waters.

5.2.1 Landfill Gases

Landfill gases are generated from the decomposition of materials and can included methane, carbon dioxide, hydrogen sulfide, and other volatile organic compounds (VOCs). Landfill gases present both chemical hazards as a result of VOC toxicity and physical hazard Landfill gases can build up within the well casing and create a pressurized condition that is released with the casing is opened. Care should be taken to ensure control of the well cap when the well is opened.

5.2.2 Solvents and Degreasers

The primarily constituents of concern identified in groundwater are TCE and PCE. At very low concentrations, these chemicals are not expected to result in any measurable exposure; however, solvents can still represent to site workers. Caution should be taken to minimize the rate of water purge, splashing of the purge water, and volatilization of contaminants present.

5.2.3 Other Chemicals and Specialty Chemicals

Specialty chemicals will involve a wide range of organic compounds, inorganic compounds, and elements, generally in very small quantities. It is the basic responsibility of individual workers to be knowledgeable about the toxic properties of the materials they use and to follow handling practices which are consistent with those properties. A worker not only must take into account the toxicity of the specific material(s) of concern, but also the physical and chemical properties, the amount and concentrations to be handled, the duration of uses, and the skills and experience of the people involved. Refer to the products' MSDS for specific information.

6.0 ENVIRONMENTAL AND PERSONNEL PROTECTION

6.1 Personal Protection

All activities are to be conducted in Level D personnel protective equipment (PPE). All personnel will be required, at a minimum, to use Level D PPE.

Level D PPE will consist of work boots, coveralls or work clothes, and gloves. Personnel observing activities shall maintain a safe distance when choosing to forego PPE.

6.2 Environmental Delineation

Environmental delineation will be achieved through the set-up and maintenance of an exclusion zone surrounding the excavation area. The only access to the exclusion zone will be through a decontamination corridor. All personnel and equipment that enters the exclusion zone must be decontaminated prior to leaving the exclusion zone. Disposable or heavily soiled equipment will be deposited and contained in marked barrels within the exclusion zone for later disposal.

6.3 Training Requirements

Prior to arrival on site, all personnel must meet the requirements of pre-assignment training as required under WAC 296-843: Hazardous Waste Site Operations. Fulcrum's project lead or field lead shall provide documentation certifying that each field technician has received 40 hours of instruction, and 24 hours of training for any workers who are on site only occasionally for a specific task. All personnel must also receive 8 hours of refresher training annually.

7.0 EMERGENCY RESPONSE

FIRE: 911

POLICE: 911

HOSPITAL: Walla Walla General Hospital
1025 South Second Avenue, Walla Walla, Washington 99362
509.525.0480

POISON CONTROL CENTER: 1.800.222.1222

EXPLOSIVE UNIT: 911

DIRECTIONS TO HOSPITAL: (following page)
Directions from the WSP site to Walla Walla General Hospital:

- **Exit the site and start going south on N. 13th Ave. toward Edith Ave.**
- **Turn left onto West Pine Street.**
- **Turn right onto S. 2nd Ave.**
- **The left into General Hospital entrance at 1025 S. 2nd Ave.**

Estimated Time: 7 minutes

I have read the above Health and Safety Plan for Groundwater Monitoring, Washington State Penitentiary, Fulcrum project number 161801.00. I am aware of the risks associated with this project as discussed both verbally and as stated in the aforementioned Health and Safety plan, and will perform in a manner to decrease the risk of bodily injury to myself or others; property damage; or negatively impact the environment.

Name (print)	Signature	Date	Company

Appendix B

Operations and Maintenance Plan

FULCRUM
environmental consulting

OPERATIONS AND MAINTENANCE PLAN

Washington State Penitentiary
1313 North 13 Street
Walla Walla, Washington

Project Number: 161801

May 16, 2017
Revised June 20, 2017

Prepared for:

Washington State Department of Corrections
Attention: Eric Heinitz
7345 Linderson Way SW
Tumwater, Washington 98501-6504

Prepared by:

Fulcrum Environmental Consulting, Inc.
406 North Second Street
Yakima, Washington 98901

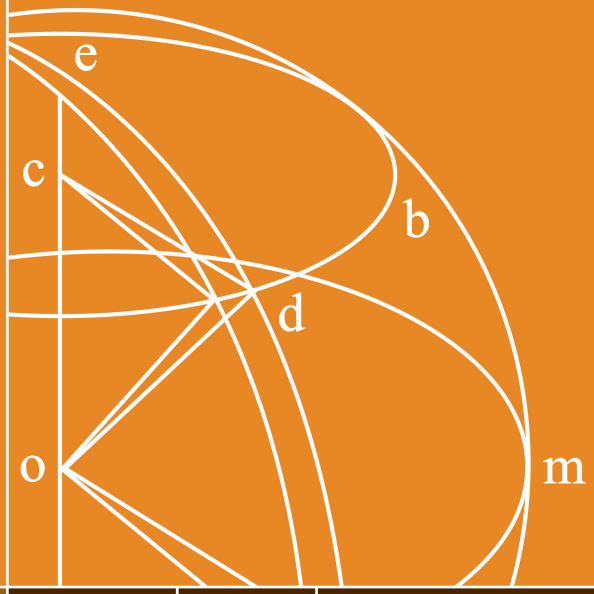


TABLE OF CONTENTS

SECTION PAGE

1.0 INTRODUCTION 1

2.0 BACKGROUND and SITE DESCRIPTION 1

3.0 NOTIFICATION PROCEDURES 3

3.1 Maintenance and Landscape Workers 3
3.2 Occasional Site Workers or Contractors 3
3.3 Environmental Covenant 4

4.0 CAP MAINTENANCE 4

4.1 Former Dry Cleaner Building 4
4.2 Landfill 4

5.0 DOCUMENTATION 5

6.0 CONCLUSIONS 5

TABLES

Table 1 Inspection and Maintenance Summary Soil and Concrete Containment Cap
Table 2 Inspection and Maintenance Log Soil and Concrete Containment Cap

Report Title: Operations and Maintenance Plan

Project Number: 1611801

Date: May 16, 2017

Site: 1313 N. 13 Street, Walla Walla, Washington

Prepared for: Washington State Department of Corrections
Attn: Eric Heinitz
7345 Linderson Way SW
Tumwater, Washington 98501-6504

Prepared by: Fulcrum Environmental Consulting, Inc.
406 North Second Street
Yakima, Washington 98901
509.574.0839

The professionals who completed site services, prepared, and reviewed this report include but are not limited to:

Authored by:  **Date:** 5.16.2017

Amanda Johnson, GIT
Fulcrum Environmental Consulting, Inc.

Reviewed by:  **Date:** 5.16.2017

Ryan K. Mathews, CIH, CHMM
Fulcrum Environmental Consulting, Inc

Report Integrity:

Fulcrum Environmental Consulting, Inc.'s scope of service for this project was limited to those services as established in the proposal, contract, verbal direction, and/or agreement. This report is subject to applicable federal, state, and local regulations governing project-specific conditions and was performed using recognized procedures and standards of the industry. Scientific data collected in situ may document conditions that may be specific to the time and day of service, and subject to change as a result of conditions beyond Fulcrum's control or knowledge. Fulcrum makes no warranties, expressed or implied as to the accuracy or completeness of other's work included herein. Fulcrum has performed these services in accordance with generally accepted environmental science standards of care at the time of the inspection. No warranty, expressed or implied, is made.

1.0 INTRODUCTION

The purpose of this Operations and Maintenance Plan (O&M Plan) is to establish long-term onsite management of protective barriers overlying soils with contaminant concentrations in excess of Washington State Department of Ecology (Ecology) Model Toxic Control Act (MTCA) Method B cleanup levels as identified in the "Draft Cleanup Action Plan, WA DOC Washington State Penitentiary Site, Walla Walla, WA, FSID 779, CSID 4971," Ecology, April 2016.

The pertinent report issued by Fulcrum Environmental Consulting, Inc. (Fulcrum) that describes the remediation plan for impacted soils is *Engineering Design Report for WSP Landfill Cleanup,* dated October 17, 2016.

The objective of this O&M Plan is to reduce the risk of workers being exposed to impacted soils and the risk of exposed soils migrating beyond property boundaries due to wind or water runoff. This O&M Plan describes the procedure for notifying Ecology, tenants, maintenance workers, and repair contractors of residual impacted soil. In addition, the O&M Plan describes the following:

- Protective barriers that are in place to prevent exposure and offsite migration.
- Recommended inspection criteria and schedule.
- Description of how site workers can protect themselves from exposure.
- Description of what to do in the event that impacted soils need to be excavated or protective barriers are breached.

2.0 BACKGROUND AND SITE DESCRIPTION

Fulcrum Environmental Consulting, Inc. (Fulcrum) has been retained by the Washington State Department of Corrections (DOC) to create an Operations and Maintenance for use during semi-annual and as-required site inspection tasks to be performed at the Washington State Penitentiary (WSP). The WSP is an active state corrections facility located in the southeastern corner of the state of Washington in the City of Walla Walla. The current address is 1313 North 13 Avenue. The Site consists of the WSP facility, the closed WSP Landfill, and the surrounding undeveloped and agricultural land owned by the State of Washington. The WSP property, including all parcels, structures, and improvements both inside and outside the confined areas, has been expanded numerous times over the years and currently occupies 560 acres.

The Site is situated on the northern slope of the east-west-trending Walla Walla Valley. The valley is gently undulating and of low local relief. The Site elevation generally ranges from 850 to 950 feet above mean sea level with general sloping toward the west (HWA 1998). The facility is located within the SE 1/4 Section 13 and the NE 1/4 Section 24, Township 7 North, Range 35 East, and the SW 1/4 Section 18, and the NW 1/4 Section 19, Township 7 North, Range 36 East, Willamette Meridian in Walla Walla County, Washington.

The Site is bounded on the east by privately-owned land and on the west by the wastewater application section of the Sudbury Road Landfill and several upgradient groundwater monitoring wells owned by

Sudbury Road Landfill. State Highway 125 and more privately-owned land bounds the Site on the north. The Site is bounded on the south by Mill Creek and a drainage pond located on a privately-owned parcel that receives storm water from the WSP and other properties in its vicinity. Properties to the east and south of the WSP include junkyards and industrial, fuel, and agricultural-chemical facilities. A Burlington Northern Santa Fe Railroad (BNSF) line that serves local industries is located along the southern edge of the property. The City of Walla Walla also bounds the Site on the south. The WSP is topographically and hydraulically upgradient of the Sudbury Road Landfill and downgradient of properties to the east and south (Ecology 2009a).

In 2010, a Remedial Investigation/Feasibility Study (RI/FS) was conducted by Parametrix at the WSP landfill and other areas of concern (AOCs) within the WSP (Parametrix 2012). For groundwater, the constituents of concern (COCs) were identified as trichloroethene (TCE), tetrachloroethene (PCE) and benzo(a)pyrene with concentrations in excess of Ecology's Model Toxics Control Act (MTCA) Method B cleanup levels.

Previous research has established that the WSP Landfill served as the principal disposal site for construction and demolition debris, ash from the penitentiary boiler, and yard and agricultural waste from the associated agricultural production from the early 1970s until 1987 (HWA 1998). In December 1991, Ecology received an anonymous complaint alleging that hazardous substances had been disposed of in the closed WSP Landfill. Materials allegedly dumped were hazardous chemicals, solvents, paints, thinners, and medical wastes. Ecology placed the WSP Landfill on the Confirmed and Suspected Contaminated Sites List in June 1992 following completion of an initial site investigation of the WSP Landfill in March 1992 (Parametrix 1995).

From 1991 through 1998, groundwater monitoring data from samples collected downgradient of the WSP and at the WSP Landfill indicated that concentration levels for volatile organic compounds (VOCs) in the shallow alluvial aquifer sometimes exceeded MTCA Method A standards, and more often exceeded the more stringent Washington State Maximum Contaminant Levels (MCLs) for drinking water. VOCs detected within the groundwater include tetrachloroethylene (PCE) and trichloroethylene (TCE).

Sudbury Road Landfill groundwater monitoring data for 1991 through 1998 indicated that groundwater quality in the shallow aquifer was being impacted by upgradient sources. In 1999, Ecology completed a Contaminant Source Identification/Assessment (CSI/A) study for potential sources of VOCs detected in the upgradient groundwater monitoring wells at Sudbury Road Landfill. The Sudbury Road Landfill is immediately west of, and downgradient of, the WSP. VOCs detected in the Sudbury Road Landfill's upgradient monitoring wells included PCE and TCE (Ecology 1999). The CSI/A study concluded that because contaminant concentrations are generally higher in the upgradient wells and lower in the downgradient wells, the Sudbury Road Landfill was not the suspected source of the VOC contamination (Ecology 2000).

Under Agreed Order No. DE 13229 remediation was completed in 2016 to the WSP Landfill by the improvement of the existing permeable landfill soil cap by re-grading the existing soil and placing additional soil to cover exposed debris, correct surface irregularities, and provide positive drainage. Within a localized portion of the landfill, a geotextile barrier and compacted crushed rock were added to 0.7 acres.

A small area (0.1 acre) next to a former dry cleaning facility on site where halogenated VOCs in the soil were identified has been capped with a concrete pad.

Compliance monitoring for groundwater will be conducted during and following remedial construction work at the site, in accordance with WAC 173-340-410. The three types of compliance monitoring to be conducted are protection monitoring, performance monitoring, and confirmation monitoring.

- Protection Monitoring to confirm that human health and the environment are adequately protected during the construction period of the interim action. Protection monitoring activities are documented in the project health and safety plan (HASP).
- Performance Monitoring will be performed to confirm attainment of cleanup levels and other performance standards. Performance monitoring activities are documented in the project Operations and Maintenance Plan.

Confirmation Monitoring will be completed to confirm the long-term effectiveness of the interim action once performance standards have been attained. Confirmation monitoring activities are documented in the Sampling and Analysis Plan.

3.0 NOTIFICATION PROCEDURES

Notifying personnel who may potentially disturb site soils is the best way to prevent inadvertent worker exposure, offsite migration of impacted soils, or destruction of protective barriers.

3.1 Maintenance and Landscape Workers

Prior to performing any work that compromises the integrity of the Landfill cleanup cover system or the former Dry Cleaner concrete cap, Ecology shall be notified and written approval received in accordance with the requirements of the Environmental Covenant.

It is unlikely that during routine maintenance and landscape tasks workers will encounter impacted site soils in excess of SRP cleanup levels. However, during non-routine tasks, maintenance and landscape workers could encounter impacted soils.

As part of a Hazard Communication program, employees, prison work crews, or subcontractors who may be expected to encounter impacted soils should be notified of the presence, location, and expected concentrations of such soils. Employees/prison work crews should also be notified of how to protect themselves should they encounter impacted soils and how to replace barrier materials so that the integrity of the protective barriers remains sound.

3.2 Occasional Site Workers or Contractors

Occasional site workers or contractors may be brought onsite to complete a specific task. Most tasks will not result in contact with impacted soil. However, some tasks which require digging may require careful

excavation and replacement of barrier materials so that impacted soils do not end up near the surface or become washed or transported offsite.

As part of a Hazard Communication program, occasional site workers/contractors who may encounter impacted soils should be notified of the presence, location, and expected concentrations of such soils. Occasional site workers or contractors should also be notified of how to protect themselves when they come in contact with impacted soils and how to replace barrier materials so that the integrity of the protective barriers remains sound.

3.3 Environmental Covenant

An Environmental Covenant will be recorded for the affected tax parcels which contains the legal requirements pertaining to impacted soils. Ecology shall be notified as required by the Environmental Covenant for any reportable events.

4.0 CAP MAINTENANCE

Site soil was capped to immobilize residual contamination. The two capped locations on the WSP are:

- Former Dry Cleaner Building
- Landfill

4.1 Former Dry Cleaner Building

This site was capped with a minimum 6" of gravel and 6" of concrete. Proper inspection and maintenance of the cap area is necessary to prevent the mobilization of contaminants in the underlying soil and to attain optimum cap life. The concrete surface should be inspected annually. An Inspection and Maintenance Summary worksheet is attached as Table 1. A sample Inspection and Maintenance Log is attached as Table 2. The concrete surface should be inspected for the following:

- Cracks in concrete surface sealed
- Polyurethane sealant present in all exposed joints
- Subsidence or frost heave not present
- Stormwater catch basin functioning with no ponding

4.2 Landfill

The site was primarily capped with a minimum of 6" of clean soil. Several areas of the site have a geotextile fabric and 12" of crushed ¾" rock [to minimize burrowing animals from contacting contaminated materials] underneath the clean soil. Proper inspection and maintenance of the soil cap area is necessary to prevent the mobilization of contaminants in the underlying soil and to attain optimum cap life. The soil cap should be inspected semi-annually for the first two years or until vegetation is established and following any unusual precipitation event that causes significant localized flooding in or around the City of Walla Walla.

An unusual precipitation event could include a rain on snow melt event or a large thunderstorm. An Inspection and Maintenance Summary worksheet is attached as Table 1. A sample Inspection and Maintenance Log is attached as Table 2. The soil and vegetated surface should be inspected for the following:

- Grass vegetation present; no deep-rooted plants.
- Soil surface uniform with minimal erosion present.
- Ground subsidence not present
- Stormwater runoff not causing sheet/rill or gully erosion

5.0 Documentation

Written records of all inspections and maintenance activities shall be kept on site for a period of 10 years for inspection by Ecology during periodic reviews. A sample inspection and maintenance log is included as Table 2 for your use.

In accordance with the Environmental Covenant, any damage to the cap or monitoring wells shall be reported to Ecology within forty-eight (48) hours of the discovery. All damage shall be repaired and a report documenting such shall be submitted to Ecology within thirty (30) days of completing the repairs, unless an alternative plan has been approved by Ecology.

6.0 CONCLUSION

This O&M Plan describes measures that should be taken to inspect and maintain the protective barriers. Inspections should be conducted, at minimum, annually. However, the landfill should be inspected semiannually for the first two years or until vegetation has been established and annually thereafter.

Table 1
Inspection and Maintenance Summary
Soil and Concrete Containment Cap

Remedial Action Item	Standard Components	Inspections		Maintenance
		Frequency	**Items to Note**	
Concrete Cap (former Dry Cleaner building)	CONCRETE SURFACE CONCRETE JOINT SEALANT STORMWATER CATCHBASIN	*Annually*	Concrete cracks?	Clean and seal cracks with polyurethane flexible joint sealant (Revere Products XJT or equal)
			Pavement: subsidence or frost heave?	Fill and seal or remove and replace, as necessary.
			Catchbasin functioning? No ponding; no excessive silt buildup	Remove excess sediment; unclog.
Soil Cap (Landfill)	Landfill Soil Cap	*Semiannually/after unusual precipitation event (prior to and following wet season)*	Burrowing animals? Subsidence? Ponding?	Fill holes and surface depressions with soil; vegetate.
			Deep rooted vegetation?	Remove woody vegetation.
			Vegetation health/coverage? Excessive weeds?	Reseed areas and treat for weeds, as necessary.
Storm Drainage System	Landfill Soil Cap	*Semiannually (prior to and following wet season)*	Is there erosion within and at the edge of the cap?	Repair with gravel/soil mix and vegetate
	Existing swale		Is the perimeter storm water swale becoming filled with sediment/eroding?	Remove sediment and/or harden to prevent erosion.
Groundwater Sampling	CONCRETE PEDESTAL WITH METAL 6-INCH DIAMETER MONUMENT 2-INCH PVC WELL CASING INSIDE OF MONUMENT WELL CASING CAP WELL MONUMENT PADLOCK	*Annually*	Is the concrete surface pedestal intact and secure? Is the well casing cap intact and secure? Is the well locked?	Pump sediment from the interior of the well casing as needed during monitoring events. Clear vegetation immediately surrounding the well. If damage to the monument or casing is evident, repairs should be made by a Licensed Well Driller

Table 2
Inspection and Maintenance Log
Soil and Concrete Containment Cap

Initial and Date	**Inspection of storm water swale and landfill soil cap**	**Existing stormwater swale**	**Concrete cap inspection**	**Landfill Soil Cap Inspection**	**Monitoring Well Inspection**
Frequency	*After major storms*	*Semi-Annually*	*Annually*	*Semi-Annually*	*Annually*
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					

Appendix C

Sampling and Analysis/Quality Assurance Project Plan

FULCRUM
environmental consulting

SAMPLING ANALYSIS PLAN/ QUALITY ASSURANCE PROJECT PLAN

Washington State Penitentiary
1313 North 13 Street
Walla Walla, Washington

Project Number: 161801

May 16, 2017

Prepared for:

Washington State Department of Corrections
Attention: Eric Heinitz
7345 Linderson Way SW
Tumwater, Washington 98501-6504

Prepared by:

Fulcrum Environmental Consulting, Inc.
406 North Second Street
Yakima, Washington 98901

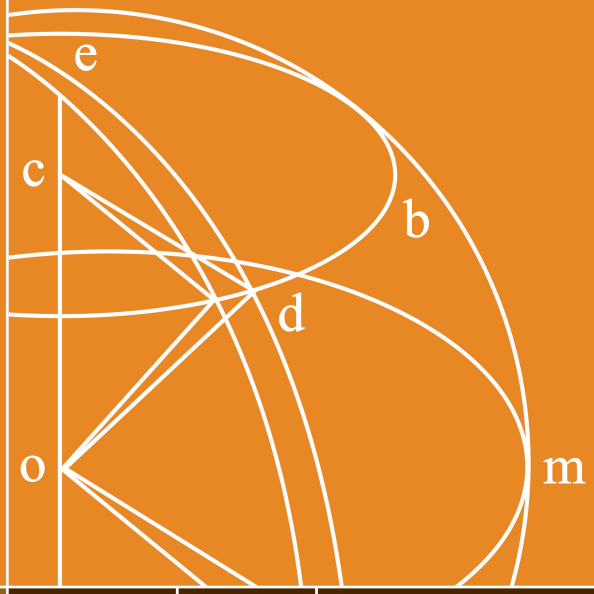


TABLE OF CONTENTS

SECTION		PAGE
1.0	BACKGROUND	1
2.0	PROJECT DESCRIPTION	2
3.0	ORGANIZATION & SCHEDULE	3
	3.1 Organization	3
	3.2 Schedule	4
4.0	QUALITY OBJECTIVES	4
5.0	SAMPLING PROCESS DESIGN	5
	5.1 Known Potential Environmental Concerns	5
	5.2 Sampling Strategy	5
	5.3 Pertinent Regulations and Approach	6
6.0	GROUNDWATER SAMPLING PROCEDURES	7
	6.1 Site Access	7
	6.2 Groundwater Monitoring Well Purging Procedure	7
	6.3 Field Instrument Calibration and Frequency	8
	6.4 Decontamination	9
	6.5 Groundwater Sample Collection	9
	6.6 Groundwater Analytical Methods	11
	6.7 Sample Custody Procedure	12
	6.8 Laboratory Sample Custody Procedure	13
7.0	MEASUREMENT PROCEDURES	13
	7.1 Data Acquisition Requirements (Non-direct Measurements)	13
	7.2 Data Management	13
8.0	QUALITY CONTROL PROCEDURES	14
	8.1 Field QC Procedures	14
	8.2 Laboratory QA/QC Procedures	14
9.0	DATA MANAGEMENT PROCEDURES	15
10.0	AUDITS AND REPORTS	16
11.0	DATA VERIFICATION AND VALIATION	16
12.0	DATA QUALITY (USABILITY) ASSESSMENT	17
13.0	REFERENCES	18

TABLES

Table 1 Organization of Project Staff and Responsibilities
Table 2 Laboratory Analyte Measurements Quality Objectives
Table 3 Well Purging Criteria
Table 4 Groundwater Sample Containers and Preservation
Table 5 QA/QC Requirements for Groundwater Analysis - Per Event

FIGURES

Figure 1 Site Location Map
Figure 2 Site Map

Report Title: Sample Analysis Plan/Quality Assurance Project Plan

Project Number: 1611801

Date: May 15, 2017

Site: 1313 N. 13 Street, Walla Walla, Washington

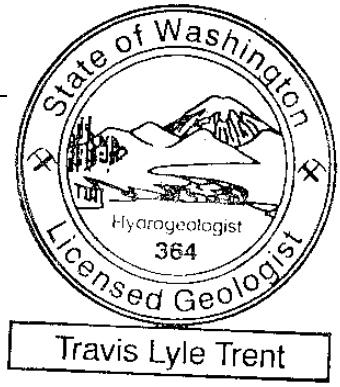
Prepared for: Washington State Department of Corrections
Attn: Eric Heinitz
7345 Linderson Way SW
Tumwater, Washington 98501-6504

Prepared by: Fulcrum Environmental Consulting, Inc.
406 North Second Street
Yakima, Washington 98901
509.574.0839

The professionals who completed site services, prepared, and reviewed this report include but are not limited to:

Authored by: _____ **Date:** 5.16.2017

Travis Trent, PG, CIH
Fulcrum Environmental Consulting, Inc.



Reviewed by: _____ **Date:** 5.16.2017

Ryan K. Mathews, CIH, CHMM
Fulcrum Environmental Consulting, Inc.

Report Integrity:

Fulcrum Environmental Consulting, Inc.'s scope of service for this project was limited to those services as established in the proposal, contract, verbal direction, and/or agreement. This report is subject to applicable federal, state, and local regulations governing project-specific conditions and was performed using recognized procedures and standards of the industry. Scientific data collected in situ may document conditions that may be specific to the time and day of service, and subject to change as a result of conditions beyond Fulcrum's control or knowledge. Fulcrum makes no warranties, expressed or implied as to the accuracy or completeness of other's work included herein. Fulcrum has performed these services in accordance with generally accepted environmental science standards of care at the time of the inspection. No warranty, expressed or implied, is made.

1.0 BACKGROUND

Fulcrum Environmental Consulting, Inc. (Fulcrum) has retained by the Washington State Department of Corrections (DOC) to create a Sample Analysis Plan (SAP), Quality Assurance Project Plan (QAPP) for use during quarterly groundwater monitoring to be performed at the Washington State Penitentiary (WSP). The WSP is an active state corrections facility located in the southeastern corner of the state of Washington in the City of Walla Walla. The current address is 1313 North 13 Avenue. The Site consists of the WSP facility, the closed WSP Landfill, and the surrounding undeveloped and agricultural land owned by the State of Washington. The WSP property, including all parcels, structures, and improvements both inside and outside the confined areas, has been expanded numerous times over the years and currently occupies 560 acres.

The Site is situated on the northern slope of the east-west-trending Walla Walla Valley. The valley is gently undulating and of low local relief. The Site elevation generally ranges from 850 to 950 feet above mean sea level with general sloping toward the west (HWA 1998). The facility is located within the SE 1/4 Section 13 and the NE 1/4 Section 24, Township 7 North, Range 35 East, and the SW 1/4 Section 18, and the NW 1/4 Section 19, Township 7 North, Range 36 East, Willamette Meridian in Walla Walla County, Washington.

See Figure 1 for the site location.

The Site is bounded on the east by privately-owned land and on the west by the wastewater application section of the Sudbury Road Landfill and several upgradient groundwater monitoring wells owned by Sudbury Road Landfill. State Highway 125 and more privately-owned land bounds the Site on the north (see Figure 1). The Site is bounded on the south by Mill Creek and a drainage pond located on a privately-owned parcel that receives storm water from the WSP and other properties in its vicinity. Properties to the east and south of the WSP include junkyards and industrial, fuel, and agricultural-chemical facilities. A Burlington Northern Santa Fe Railroad (BNSF) line that serves local industries is located along the southern edge of the property. The City of Walla Walla also bounds the Site on the south. The WSP is topographically and hydraulically upgradient of the Sudbury Road Landfill and downgradient of properties to the east and south (Ecology 2009a).

See Figure 2 for the extent of the site.

In 2010, a Remedial Investigation/Feasibility Study (RI/FS) was conducted by Parametrix at the WSP landfill and other areas of concern (AOCs) within the WSP (Parametrix 2012). For groundwater, the constituents of concern (COCs) were identified as trichloroethene (TCE), tetrachloroethene (PCE) and benzo(a)pyrene with concentrations in excess of Ecology's Model Toxics Control Act (MTCA) Method B cleanup levels.

Previous research has established that the WSP Landfill served as the principal disposal site for construction and demolition debris, ash from the penitentiary boiler, and yard and agricultural waste from the associated agricultural production from the early 1970s until 1987 (HWA 1998). In December 1991, Ecology received an anonymous complaint alleging that hazardous substances had been disposed of in the closed WSP

Landfill. Materials allegedly dumped were hazardous chemicals, solvents, paints, thinners, and medical wastes. Ecology placed the WSP Landfill on the Confirmed and Suspected Contaminated Sites List in June 1992 following completion of an initial site investigation of the WSP Landfill in March 1992 (Parametrix 1995).

From 1991 through 1998, groundwater monitoring data from samples collected downgradient of the WSP and at the WSP Landfill indicated that concentration levels for volatile organic compounds (VOCs) in the shallow alluvial aquifer sometimes exceeded MTCA Method A standards, and more often exceeded the more stringent Washington State Maximum Contaminant Levels (MCLs) for drinking water. VOCs detected within the groundwater include tetrachloroethylene (PCE) and trichloroethylene (TCE).

Sudbury Road Landfill groundwater monitoring data for 1991 through 1998 indicated that groundwater quality in the shallow aquifer was being impacted by upgradient sources. In 1999, Ecology completed a Contaminant Source Identification/Assessment (CSI/A) study for potential sources of VOCs detected in the upgradient groundwater monitoring wells at Sudbury Road Landfill. The Sudbury Road Landfill is immediately west of, and downgradient of, the WSP. VOCs detected in the Sudbury Road Landfill's monitoring wells located on its eastern border (downgradient from the WSP) included PCE and TCE (Ecology 1999). The CSI/A study concluded that because contaminant concentrations are generally higher in the Sudbury upgradient wells and lower in the downgradient wells, the Sudbury Road Landfill was not the suspected source of the VOC contamination (Ecology 2000).

Under Agreed Order No. DE 13229 remediation was completed in 2016 to the WSP Landfill by the improvement of the existing permeable landfill soil cap by re-grading the existing soil and placing additional soil to cover exposed debris, correct surface irregularities, and provide positive drainage. Within a localized portion of the landfill, a geotextile barrier and compacted crushed rock were added to 0.7 acres. A small area (0.1 acre) next to a former dry cleaning facility on site where halogenated VOCs in the soil were identified was also excavated, backfilled and covered with concrete pad.

This Sampling and Analysis/Quality Assurance Project Plan (SAP/QAPP) is designed to facilitate post-remediation groundwater monitoring activities at the site. Groundwater site quality data, collected in conformance with Ecology criteria, is intended to satisfy regulatory requirements and to facilitate site cleanup.

2.0 PROJECT DESCRIPTION

The primary goal of this monitoring program is to provide post-remediation groundwater quality data to confirm the effective sequestration of halogenated volatile organic compounds (HVOCs) and benzo(a)pyrene at the site. Contaminants of concern include the chlorinated solvents TCE and PCE and poly-aromatic hydrocarbons (PAHs) in the form of benzo(a)pyrene.

Tasks to meet this objective are:

- Complete quarterly groundwater sampling events of the fourteen (14) existing monitoring wells for constituents of concern and MNA parameters including:
  - VOCs by EPA Method 8260C/624
  - Benzo(a)pyrene by EPA Method 8270D (SIM)
  - Dissolved Iron and Manganese by EPA Method 6020
  - Total Chromium by EPA Method 200.8
  - Total Hexavalent Chromium by EPA Method 7196
  - Nitrate, Nitrite, and Sulfate by EPA Method 300.0
  - Methane by RSK-175
  - Alkalinity by SM 2320B

- Collect one additional field duplicate sample for Quality Assurance/Quality Control purposes during each monitoring event.

- Provide data evaluation and quarterly reporting of monitoring events. Prepare in-progress quarterly reports for each monitoring event. Each report will include:
  - Maps of the study area showing sample collection locations, water levels in monitoring wells, groundwater flow and transport, contaminant concentrations and distribution.
  - Discussion of water quality results.
  - Comparison of results to the cleanup standards for the contaminants of concern, to use in evaluating the success of remediation efforts.
  - Significant or potentially significant findings.

- Submit an annual groundwater monitoring report to Ecology.

3.0 ORGANIZATION & SCHEDULE

3.1 Organization

Table 1 lists the people involved in this project, their respective organization, and their role.

Table 1: Organization of Project Staff and Responsibilities

Person/Agency or Firm	Role/Responsibility
Eric Heinitz Washington State Dept. of Corrections 360.725.8397	DOC property coordinator.
Sandra Treccani Washington State Dept. of Ecology 509.329.3412	Ecology project coordinator.
Ryan Mathews, CIH, CHMM, Principal Fulcrum Environmental Consulting, Inc. rmathews@efulcrum.net, 509.574.0839	Reviews the project scope and budget, tracks progress.
Travis Trent, PG, CIH Fulcrum Environmental Consulting, Inc. ttrent@efulcrum.net, 509.993.4739	Project management and senior review.

Person/Agency or Firm	Role/Responsibility
Mike Ridgeway, Project Manager Fremont Analytical, Inc. mridgeway@fremontanalytical.com, 206.352.3790	Responsible for completion of analytical laboratory work tasks, including laboratory analysis, sample container provision, laboratory QA/QC, and review of laboratory analysis results.

3.2 Schedule

Quarterly groundwater monitoring will be performed every three months per annum (four times per year) until the site receives a No Further Action decision from the Department of Ecology.

4.0 QUALITY OBJECTIVES

The primary goal of this project is to monitor the nature and extent of halogenated VOCs and benzo(a)pyrene in the groundwater at the Site. To do this, samples collected should be representative of site groundwater conditions. However, variations in the level of site groundwater chemistry can occur due to natural environmental heterogeneity or alternates caused by the sampling and analytical procedures.

For this project to succeed, the precision (random error) and bias (systematic error) of the sample results must be low to reveal variability in concentrations between samples. Standard procedures will be used when collecting and handling soil and groundwater samples to minimize any bias caused by the sampling process.

The precision and bias routinely obtained by the project laboratory for the selected analytical methods will meet the measurements quality objectives (MQOs) for this project. Table 2 lists the MQOs for assessing project data quality. Recovery limits (RL) and method reporting limit (MRL) are a function of the analytical methodology, laboratory equipment, and concentration of other analytes in the sample. For instance, a sample with an appropriate methodology, sensitive laboratory equipment, and very low or non-detect concentrations of analytes will typically achieve an exceptionally low MRL, often more than an order of magnitude below Model Toxic Control Act (MTCA) cleanup regulations. However, the same sample with a mixture of similar analytes, may result in interferences among like analytes or sample dilution may result in significantly higher MRLs. As such, MRLs on samples collected during an investigation are likely to vary in RL and MRL.

Intent of this investigation is not specifically to demonstrate that any areas of the site are free of contamination. Rather, the intent is to identify the presence and magnitude of impact to the environment. Fulcrum intends that samples collected during this investigation will include those from worst case locations and others will likely represent samples without any identified analytes.

These goals are based on performance characteristics of measurements done by the project laboratory. Analytical and field quality control samples are discussed in Section 8 *Quality Control Procedures*.

Table 2: Laboratory Analyte Measurements Quality Objectives (MQOs)

Parameter	LCS% Recovery Limits	Laboratory Replicates (RPD)	Matrix Spikes% Recoveries	Matrix Spikes Duplicates (RPD)	Project Laboratory Reporting Limit
Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 8260C/624					
Tetrachloroethene (PCE)	47.5-147%	30%	50.3-133%	30%	1 ug/L
Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270D (SIM)					
Benzo(a)pyrene	38.4-121%	30%	34.5-131%	30%	0.1 ug/L
Dissolved Iron and Manganese by EPA Method 6020					
Iron	85-115%	30%	50.3-133%	30%	2 ug/L
Manganese	85-115%	30%	50.3-133%	30%	2 ug/L
Total Chromium by EPA Method 200.8					
Chromium, Total	85-115%	30%	70-130%	30%	10 ug/L
Total Hexavalent Chromium by EPA Method 7196					
Chromium, Hexavalent [2]	90-110%	20%	65-135%	30%	5 ug/L
Nitrate, Nitrite, and Sulfate by EPA Method 300.0					
Nitrate	80-120%	20%	80-120%	20%	0.1 mg/L
Nitrite	80-120%	20%	80-120%	20%	0.1 mg/L
Sulfate	80-120%	20%	80-120%	20%	0.3 mg/L
Methane by EPA Method RSK-175					
Methane	80-120%	30%	50.3-133%	30%	0.005 mg/L
Alkalinity by EPA Method 2320B					
Alkalinity, Total	80-120%	30%	50.3-133%	NA	0.005 mg/L

LCS Laboratory Control Standard
RPD Relative Percent Difference
1 Unless otherwise specified, the provide Reporting Limit applies to all other analytes.
2 Hexavalent chrome will only be analyzed for if total chromium is detected above the MTCA Level A cleanup level of 48 ug/l.

5.0 SAMPLING PROCESS DESIGN

Site investigation will consist of quarterly monitoring of site groundwater.

5.1 Known Potential Environmental Concerns

Previous site activities have identified two environmental concerns:

- Release of halogenated volatile organic compounds (HVOCs) into the groundwater
- Release of poly-aromatic hydrocarbons (PAHs) into the groundwater

5.2 Sampling Strategy

The selected sampling strategy is designed to provide sampling and analysis of groundwater from the site to document the effectiveness of remediation.

Two potential sources of groundwater impacts are present at the WSP site. The two sources include:

- Former WSP Dry Cleaning Facility
- Closed WSP Landfill

The following onsite monitoring wells will be sampled; MW-1, MW-2, MW-3, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14 and MW-15. Based on the general site information, monitoring wells will be analyzed for not less than the following:

- VOCs by EPA Method 8260C/624 (all wells)
- Benzo(a)pyrene by EPA Method 8270D (SIM) (MW-3 and MW-9)
- Dissolved Iron and Manganese by EPA Method 6020
- Total Chromium by EPA Method 200.8
- Total Hexavalent Chromium by EPA Method 7196 [1]
- Nitrate, Nitrite and Sulfate by EPA Method 300.0
- Methane by RSK-175
- Alkalinity by EPA Method SM 2320B

[1] Samples will be analyzed for total hexavalent chromium only if total chromium is detected over the standard of 48 ug/l.

Field evaluation of temperature, specific conductance, pH, dissolved oxygen (DO), and oxidation-reduction potential (ORP) will be completed during monitoring events.

Groundwater flow direction is inferred to be a westerly direction. To evaluate groundwater flow at the site, monitoring of groundwater levels will be completed during quarterly field events. See Figure 2 for the extent of the site and the locations of the groundwater monitoring wells to be sampled.

5.3 Pertinent Regulations and Approach

In March of 1989, the Model Toxics Control Act (MTCA) went into effect in Washington State. The MTCA regulations set standards to ensure quality of cleanup and protection of human health and the environment. A major portion of the MTCA regulation (completed in 1991) was the development of numerical cleanup standards and requirements for cleanup actions. Three options were established under MTCA for site-specific cleanup levels: Method A, B, and C. Method A defines cleanup levels for 25 of the most common hazardous substances found at sites. Method B levels are set using a site risk assessment, which enables consideration of site-specific characteristics. Method C is similar to Method B, however, the individual substance's cancer risk portion of the assessment is set at 1 in 100,000 rather than 1 in 1,000,000.

Ecology's MTCA Method A cleanup tables were developed to provide conservative cleanup levels for sites undergoing routine cleanup actions or those sites with relatively few hazardous substances. Method A cleanup levels are specifically designated as appropriate for residential facilities and are appropriate for a conservative approach at school and public sites.

Ecology's MTCA Method B cleanup levels will be used to determine cleanup action effectiveness and compliance.

6.0 GROUNDWATER SAMPLING PROCEDURES

Groundwater monitoring events will be completed at approximately quarterly intervals throughout the year. If requested by Ecology, Corrections shall allow Ecology and/or its authorized representative to take split or duplicate samples of any samples collected by Corrections pursuant to implementation of this Order. Corrections shall notify Ecology seven (7) days in advance of any sample collection or work activity at the Site. Ecology shall, upon request, allow Corrections and/or its authorized representative to take split or duplicate samples of any samples collected by Ecology, provided that doing so does not interfere with Ecology's sampling. Without limitation on Ecology's rights under access, Ecology shall notify Corrections prior to any sample collection activity unless an emergency prevents such notice.

All monitoring wells are constructed of 2-inch polyvinyl chloride piping and will be sampled using the low-flow, low-purge sampling method. Samples collected from the monitoring wells will be assumed to be representative of the groundwater quality at the site.

Monitoring wells will be sampled in order from the likely lowest concentration of environmental contaminants to the highest. Following the initial groundwater sampling event, this approach will be refined based on the analytical results.

The wells will be purged and sampled with a peristaltic pump, using dedicated tubing, at a pump rate of less than or equal to 1.0 liters per minute. The wells will be purged through a continuous flow where pH, temperature, specific conductance, and dissolved oxygen will be monitored and recorded at regular intervals of 2 to 5 minutes. Purging will continue until field parameter readings stabilize as shown in Table 3.

6.1 Site Access

Ecology or any Ecology authorized representative shall give reasonable advance notice before entering any area of the Site outside the secure perimeter of the Penitentiary controlled by Corrections, unless an emergency prevents such notice. Some of the monitoring wells to be sampled are located within the secure perimeter and therefore, access will be required for sampling personnel within specific secured areas.

Ecology or any Ecology representative shall not take photographs of the Site which include offenders incarcerated in the custody of Corrections. Ecology employees and their representatives shall not be required to sign any liability release or waiver as a condition of Site property access.

6.2 Groundwater Monitoring Well Purging Procedure

Field activities will include the following process at each of the monitoring wells beginning with the up-gradient well, and transitioning to the down-gradient wells:

- Unlock well, remove compression plug, and allow groundwater to equilibrate for 15 minutes.
- Measure water level to the nearest 0.01-feet using water level probe.
- Set up peristaltic or applicable pump and begin purge.
- Maintain flow rate less than or equal to 0.5 liter per minute during the purge event (but greater than 0.15 liters per minute).
- Collect field parameters at regular intervals of 2 to 5 minutes.
- Monitor field parameters of temperature, pH, dissolved oxygen, electrical conductivity, turbidity and oxidation reduction potential to confirm stabilization of discharge water (in accordance with Table 3, Well Sampling Criteria).
- Decrease purge rate to 0.15 liters per minute for sample collection.
- Collect samples for laboratory analysis.
- Secure the wells and demobilize from location.

6.3 Field Instrument Calibration and Frequency

Field instruments that will require calibration are dissolved oxygen (DO)/electrical conductivity (EC), pH, temperature and oxidation-reduction potential (ORP). The field instruments will be calibrated prior to each day's use in accordance with procedures and schedules recommended by the manufacturer. All calibration data will be recorded in the instrument log, and field notebook. Operation and calibration procedures for each field instrument will be conducted prior to the start of sampling.

Field instruments and equipment will be inspected and tested prior to, and at the conclusion of, each day's sampling to ensure proper function and integrity. Should any instrument be dropped or similarly impacted during the sampling day, the instrument will be immediately inspected to determine if any damage has occurred and shall be recalibrated.

Field technicians are responsible for employing properly functioning equipment. If an equipment malfunction is suspected, the technician is to stop work and verify that the equipment is functioning properly. If the equipment is found to be malfunctioning, the technician will make a determination as to whether or not it can be repaired in the field without affecting the integrity of the equipment. If the repair can be accomplished under these constraints, then the technician will do so (i.e. battery replacement). If the repair will affect the equipment integrity then the equipment will be tagged to identify the suspect problem and set aside until a qualified technician can repair the equipment or the equipment is replaced.

Equipment that fails calibration or becomes inoperable during use will be removed from service and either segregated to prevent inadvertent use or tagged to indicate it is out of calibration. Such equipment will be repaired and satisfactorily recalibrated prior to reuse. Equipment that cannot be repaired will be replaced. Data collected with equipment that later fails recalibration will be evaluated. If the data appears to be affected, the results of the evaluation will be documented and the appropriate personnel notified.

6.4 Decontamination

Field equipment that directly contacts water samples or sample containers will be decontaminated prior to use and between each sampling event. The following procedures will be utilized to prevent cross contamination of samples collected during this project.

- Excess moisture will be removed from equipment
- Field equipment will then be washed in a solution of Alconox™, Liquinox™, or comparable non-hazardous laboratory detergent product
- Field equipment will then be rinsed with distilled/deionized water
- Field equipment will then be placed on clean toweling or similar material and allowed to air dry
- Prior to measurement collection, instruments will be rinsed with well discharge water

After the sample is collected and the container lids are tightly sealed the exterior portion of the sample container will be cleaned. Care will be taken to ensure that sample labels remain legible during the exterior container cleaning.

Disposable nitrile gloves will be used while collecting samples. New disposable gloves will be used for each sample location.

Purge water will be initially collected and stored onsite in a 55-gallon barrel. Disposal of purge water shall occur in accordance with WAC 173-303. If no analytes are identified in a well during the initial monitoring event, subsequent purge water from that well during follow-up events will be discharged to ground.

6.5 Groundwater Sample Collection

The following general procedures will be utilized during sample collection and preparations. New nitrile protective gloves will be worn during water sampling activities. Sample container lids will be checked to ensure cleanliness and that it is secured. Containers will be carefully labeled with the appropriate information. Only waterproof ink will be used to complete sample container labeling. Samples will then be transferred to a cooler for preservation. Samples will be stored at 4° C, if required by analytical method being requested. Additional pertinent information will be recorded on chain-of-custody forms. All pertinent field information will be recorded in the field logbook or field forms, such as:

- Sample location designation, including general sampling location condition and pertinent observations of surrounding area.
- Weather conditions.
- Purge volume calculations or time required to reach measured parameter equilibrium.
- Manufacturer, model number and calibration results of meters/instruments used to measure field parameters.
- Purging or equilibrium start time, finish time, rate, and total or estimated volume.
- Field parameter measurements made for each required volume measurements.
- Time of sample collection.
- Initials of samplers.

- Laboratory analysis to be performed.
- Any miscellaneous comments or observations.

Samples will be collected when the parameters established in Table 3 are met:

Table 3: Well Sampling Criteria

Purge Parameter	Stabilization Criteria
Water Level	≤ 0.3 feet of drawdown during well sampling
pH	± 0.1 standard units
Temperature	± 0.1° Celsius
Specific Conductance	± 10.0 umhos/cm for values < 1,000 umhos/cm
Dissolved Oxygen	± 0.05 mg/L for values < 1 mg/L
Oxidation Reduction Potential	± 10 millivolts

Sources: *ASTM Standards on Environmental Sampling*, 1995.
Standard Operating Procedure for Purging and Sampling Monitoring Wells plus Guidance on Collecting Samples for Volatiles and other Organic Compounds, 2014.

Samples will be collected from each well at the completion of purging. The sample will be collected directly from the pump's discharge tubing into appropriate sample containers. See Table 4 for sample containers. Filtered samples will be field filtered as needed, with a clean high-capacity, in-line 0.45 micron membrane filters.

Filled sample bottles will be labeled with a unique sample number, placed in re-sealable plastic bags and then stored in ice-filled coolers. Samples will be transported to Fulcrum's office for packaging and overnight shipment by a commercial carrier under chain-of-custody.

Unless modified by special site factors, the following methodology will be followed for collection of all groundwater samples submitted for analysis:

- Obtain the required number of labeled, pre-preserved and un-preserved containers as specified in Table 4 for the selected laboratory analysis. Verify that preservative, if necessary for analysis is present within the sample containers. Use additional containers to collect the specified duplicates.

- Fill out the sample labels for sample containers (required number of sample containers to be submitted for analysis) in waterproof ink. In addition to the sample collectors name and the sample number, noting the preservative(s) used, and the exact location, date and time of sample collection.

- When using preserved containers, hold the container at an angle, slowly fill it at a low-flow rate of 0.15-0.5 L/min to as close to the top as possible. As the sample fills, slowly tip the container upright so as to form a meniscus (the curved upper surface of the water formed by surface tension) at the top. Be careful not to wash out preservatives used. To avoid aeration, an alternative method is to insert the tubing into the container and draw the tubing up as the water rises.

- If a meniscus is not formed, or cannot be formed without overfilling the container and washing out the preservative, fill the container cap with sample water and slowly pour it into the container to form a meniscus.

- Screw on the cap and turn the container upside down and tap it with a finger. If any bubbles appear, uncap the container, add more water to the meniscus, recap, turn over and repeat until none appear.
- Shake the container for one minute, if a preservative was present in the container.
- Repeat steps 4-9 above for QA/QC duplicates, blanks and split samples, if necessary.

Wrap the glass containers in a bubble pack or other type of padded packing material to prevent breakage. Store the samples in an ice filled cooler at 4° C until delivery to the laboratory.

6.6 Groundwater Analytical Methods

The following analytical methods and QA/QC will be completed for groundwater samples.

Table 4: Groundwater Sample Containers and Preservation

Analytical Parameter and Method	Filtered	Container	Preservative	Maximum Holding Time
Volatile Organic Compounds by EPA Method 8260C	No	Three 40 mL vials with Teflon lined septa caps	Preserve with 1:1 HCl, Cool to 4ºC	Analyze within 14 days
PAHs by EPA Method 8270D (SIM)	No	One 1-liter amber glass jar with Teflon lined lid	No Preservative, Cool to 4ºC	Extract within 7 days, Analyze within 40 days
Dissolved Iron and Manganese by EPA Method 6020	Yes	500 mL Polyethylene	HNO_3	Analyze within 14 days
Total Chromium by EPA Method 200.8	No	500 mL Polyethylene	HNO_3	Analyze within 14 days
Total Hexavalent Chromium by EPA Method 7196	No	500 mL Polyethylene	HNO_3	Analyze within 24 hours
Nitrate, Nitrite, and Sulfate by EPA Method 300.0	No	250 mL Polyethylene	No Preservative, Cool to 4ºC	Analyze within 48 hours
Methane by RSK-175	No	Three 40 mL vials with Teflon lined septa caps	Preserve with 1:1 HCl, Cool to 4ºC	Analyze within 14 days
Alkalinity by SM 2320B	No	1 L Polyethylene	No Preservative, Cool to 4ºC	Analyze within 28 days

Table 5: QA/QC Requirements for Groundwater Analysis – Per Event

Parameters/ Method	Total Field Samples[a] /Containers	QA/QC Sample Summary Analyses/Containers			
		Organic MS/MSD	Inorganic MS/MSD	Rinsate Blanks[b]	Trip Blanks
Volatile Organic Compounds by EPA Method 8260C	3 + d	1/1	NA	NA	Yes
PAHs by EPA Method 8270D (SIM)[c]	1 + d	1/1	NA	NA	No
Dissolved Iron and Manganese by EPA Method 6020	1 + d	NA	1/1	NA	No
Total Chromium by EPA Method 200.8	1 + d	NA	1/1	NA	No
Total Hexavalent Chromium by EPA Method 7196 [d]	1 + d	NA	1/1	NA	No
Nitrate, Nitrite, and Sulfate by EPA Method 300.0	1 + d	NA	1/1	NA	No
Methane by RSK-175	3 + d	1/1	NA	NA	No
Alkalinity by SM 2320B	1 + d	NA	1/1	NA	No

[a] Total number of monitoring wells to be sampled for VOCs is fourteen (14).
[b] Rinsate blanks only required for 1 in 20 samples per non-dedicated sampling device.
[c] Only two (2) wells, MW-3 and MW-9, to be sampled for benzo(a)pyrene.
[d] Hexavalent chromium only to be analyzed for if total chromium detected above 48 ug/l.
All wells to be sampled for natural attenuation parameters (iron, manganese, nitrate, nitrite, sulfate, methane and alkalinity).
NA Not Applicable
d Duplicate

One duplicate sample will be collected for each monitoring event and analyzed for all analytes under evaluation.

6.7 Sample Custody Procedure

Each sample will have a unique number. The specific designation for the samples will be based on the date of sampling and number representing the monitoring well sampled. For example, sample number 012216-MW01 would represent monitoring well 01, sampled on January 22, 2016.

A duplicate sample shall be assigned the next sequential monitoring well (e.g. MW-06 if five monitoring wells are installed at the project) and assigned a collection time that is within the other samples collected during the monitoring event.

A chain-of-custody record will be filled out and accompany each set of samples to document sample possession from sample collection through analytical reporting. All pertinent fields shown on the chain-of-custody form will be completed using an ink pen prior to sample shipment. A copy of this record will be maintained with analytical results and will be included in subsequent data reporting.

Samples that need to go to an offsite laboratory will be transported next-day delivery service to the laboratory for analysis. The chain-of-custody record will accompany the samples. All samples will then be delivered directly to the laboratory. Packaging and shipping of samples to the offsite laboratory will be per the following protocol:

1. Sample container lids will be secured with custody tape and packing tape as necessary.
2. About two inches of cushioning material will be placed in the bottom of the cooler.
3. Sample containers will be placed in the cooler in a manner to prevent breakage.
4. Glass jars will be placed in resealable plastic bags and centered in the cooler to prevent breakage.
5. Samples will be packed in ice enclosed in resealable plastic bags or freeze packs ("blue ice").
6. QA/QC samples will be packaged with the samples that were collected that day.
7. Free space in the cooler will be filled with cushioning material.
8. Chain-of-custody paper work will be placed in plastic bags and placed inside the cooler.
9. Cooler will be wrapped with strapping tape to seal it closed.
10. Samples will be shipped by commercial carrier for next day delivery.
11. Use of separate coolers to protect more delicate sample containers, such as 40 milliliter vials, is encouraged.

When a sample set is delivered to the delivery service, the shipper will receive a copy of the shipping documentation. This documentation will be placed in the project file with the chain-of-custody paperwork.

6.8 Laboratory Sample Custody Procedure

Upon receipt of the shipping container, the laboratory will inspect the integrity of the container seal. The cooler will be opened and the shipment checked versus the chain-of-custody record. Any inconsistencies or problems with a sample shipment will be noted and resolved. Once at the laboratory the samples will be tracked through the laboratory by internal custody procedures. QA/QC procedures to be followed by the selected laboratory will be per the pertinent laboratory QA manual.

7.0 MEASUREMENT PROCEDURES

7.1 Data Acquisition Requirements (Non-direct Measurements)

Non-direct data measurements are those items that require a subjective assessment. Items such as weather, sampling location, problems with sample collection, etc. will be logged in the field notebook.

7.2 Data Management

Field data will be recorded in the field notebooks by trained technicians. Daily observation reports will be generated by Fulcrum and submitted for internal review. Hard copies of the laboratory analytical reports will be transmitted to Fulcrum. The project laboratory will review and validate analytical data in accordance with their internal QA/QC program.

The project manager will review field notebooks and the project laboratory's analytical data to assure that all pertinent information is accounted for and is correlated. The project manager will review sample collection data and analytical data and summarize the information in a database or report format.

Hard copies of all field notebooks, chain-of-custody forms, analytical data, laboratory reports, assessment reports, and all electronic databases will be maintained by Fulcrum until project completion. Upon project completion, summary records will be archived for a period of 30 years beyond final project completion date. Support and backup data will be archived for 5 years beyond date of data generation.

8.0 QUALITY CONTROL PROCEDURES

8.1 Field QC Procedures

Field quality control will be maintained through the use of standard operating procedures for sample collection, handling, and documentation. Any problems occurring during the sample process will be recorded in the field notebook or field datasheets.

Field quality control will also consist of collecting and analyzing field replicate samples. Field replicates are three samples collected sequentially. Replicates will be used to confirm stabilization of groundwater field parameters prior to groundwater sample collection.

Duplicates and split samples will be collected as part of sampling activities. The number, type and handling of QA/QC samples are specified in Table 5.

Duplicate samples are used to check the precision of field collection or laboratory analyses and verifies repeatability of the sample data. Duplicates are collected the same time as the sample. The duplicate sample will be collected by evenly splitting the collected sample such that both sub-samples are comparable and representative of the single sample. Collect duplicate samples from the sample location that is believed to have elevated levels of a particular compound.

Duplicates will be collected on a frequency of one per analysis being completed for soil samples and one per event for groundwater monitoring.

8.2 Laboratory QA/QC Procedures

Routine quality control procedures will suffice to demonstrate that the Measurement Quality Objectives (MQOs) for this project have been met. Laboratory quality control tests consist of method blanks, matrix spikes, as wells as duplicate and check standards (laboratory control standards). Surrogate recoveries will also be included for the organic analysis. Surrogate recoveries will be used to judge the accuracy for analysis of similar target analytes. Analytical precision can be estimated from duplicate and check standards, duplicate sample analysis, and duplicate spiked sample analyses. Analytical bias will be estimated from matrix spikes, matrix spike duplicates, and check standards. Recoveries from check standards provide an

estimate of bias due to calibration. Mean percent recoveries of spiked sample analyses provide an estimate of bias due to interference.

The project laboratory staff will report results of quality control analyses in the same units as expressed for the MQOs. They will also conduct quality assurance review of all analytical data generated at the project laboratory prior to releasing the data to the project manager.

The laboratory will be responsible for following their established QA/QC procedures and those required by the analytical methods. The following minimum QA/QC procedures will apply:

1. Sample holding and preservation requirements will be in accordance with analytical method reference parameters.
2. Instrument tuning and calibration will be performed as required by the analytical method.
3. Laboratory QA/QC samples (duplicates) will be analyzed at frequencies specified by EPA, Ecology, and analytical reference methods.
4. The laboratory will review the data package for performance, quality, and completeness.
5. The method detection limit for the parameter analyzed will be below regulatory guidance levels.
6. All laboratory parameters (recoveries, spikes, duplicates, etc.) are within their stated limits.

Laboratory instrumentation will meet applicable calibration requirements to ensure that the instrumentation is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable quantitative performance at the onset of analysis; calibration during operation verifies acceptable performance of the instrument on a day-to-day basis. Tuning and instrument performance criteria will also be established, as appropriate to ensure that instrument measurements may be interpreted correctly.

Laboratory calibration procedures are specified in the protocol for the specific analytical methods used. When there are no previously defined specifications, the calibration procedures will include:

- An initial and final three-point calibration before and after a run.
- A mid-range calibration after every tenth sample.

9.0 DATA MANAGEMENT PROCEDURES

At the completion of each sampling event, all field data and laboratory analytical data will be compiled and evaluated against the project MQOs.

Field methods and forms will be reviewed to assure consistency. Field datasheets will be checked for missing or improbable measurements before leaving each site. Field data entered into spreadsheets or databases will be checked against the field datasheets for errors or omissions. Missing or unusual field parameter data will be omitted from the data set.

Field replicate variability will be evaluated by calculating the relative percent difference (RPD) for each duplicate set of samples and compared to the quality objectives listed in Table 2.

Laboratory-generated data review and reporting will follow the procedures outlined in the project laboratory's quality assurance program. Lab results will be checked for missing or questionable data. Individual data which fails to achieve QA/QC objectives will be flagged with appropriate qualifiers and their use restricted as appropriate. A standard case narrative of laboratory QA/QC results will be sent to the project manager for each sampling event.

If the data review and verification suggests widespread problems with QA/QC for a sample event, the sample event or individual sample may be repeated at the discretion of the project client and manager.

10.0 AUDITS AND REPORTS

The project laboratory participates in performance and system audits of their routine procedures and is an environmental laboratory accredited by the Washington State Department Ecology as of June 30, 2016. See the following link for currently accredited laboratories:

http://www.ecy.wa.gov/programs/eap/labs/documents/AllAccreditedLabListInternet.pdf

Results of the project laboratory's performance and system audits of their routine procedures are available on request.

Fulcrum will provide in-progress reports for the project, including an initial soil investigation and groundwater monitoring event and subsequent in-progress reports following each groundwater monitoring event. A final project report will be prepared and issued as a portion of the IPG.

Draft versions of the report will be prepared to relevant project team members, including Ecology's' site manager, prior to report finalization. Data will be completed in Ecology's Environmental Information Management (EIM) system as a component of report finalization.

11.0 DATA VERIFICATION AND VALIATION

As part of data review, field notes and data from the project laboratory will be reviewed for errors and omissions and to ensure that data are correct, complete, and consistent.

Other items that will be reviewed include:

- Results for quality control samples described in Quality Control section of this document accompany sample results.
- Quality control results indicate that acceptance criteria were met.
- Data qualifiers are properly assigned where necessary.

- Data specified in the Sampling Design section above were obtained.
- Methods and protocols specified in this QAPP were followed.

Analytical data generated by the project laboratory will be reviewed and verified by comparison with acceptance criteria according to the data review procedures outlined in the laboratory's quality assurance program. Results that do not meet quality assurance requirements will be labeled with appropriate qualifiers, and an explanation will be described in a quality assurance memorandum attached to the data package.

After receiving the data package, the field manager will verify that the results have met the measurement quality objectives for bias, precision, and accuracy. Precision will be estimated by calculating the RPD for the field duplicate results. Analytical bias is assumed to be within acceptable limits if laboratory quality control limits are met for blanks, matrix spikes, and check standards. Overall accuracy will be assessed by comparing the measured result with the true value of the blind reference sample. If appropriate, sampling procedures, quality control steps, or analytical procedures will be modified to address identified problems.

Once the data have been reviewed, verified, and validated, the project manager will determine if the data can be used toward the project goals and objectives. A technical report will be prepared at the completion of all sampling and will include the following:

- Maps of the study area showing sample sites, water levels, groundwater flow direction, contaminant concentrations, and distribution.
- Description of field and laboratory methods.
- Discussion of data quality and the significance of any problems encountered.
- Summary tables of field and analytical data.
- Discussion of water quality results. Comparison of results to the cleanup standards for the constituents of concern that will be used to evaluate the effectiveness of the cleanup action.
- Significant or potentially significant findings.
- Recommendations based on project goals.

12.0 DATA QUALITY (USABILITY) ASSESSMENT

All field and laboratory data will be entered and stored in Ecology's Environmental Information Management database (EIM) once it has been reviewed and verified. Once all the data has been entered into EIM, the project manager will independently review 10% of the project data for possible errors. If significant data entry errors are discovered, a more intensive review will be undertaken.

An EIM user study will be requested from Ecology's EIM coordinator for this project. All monitoring data will be available via the internet once the project data have been validated. The URL address for the database is: http://apps.ecy.wa.gov/eimreporting/search.asp.

All paper and electronic files created for this project will be kept with the project data files according by Fulcrum.

13.0 REFERENCES

ASTM Standards on Environmental Sampling, Designation: D2270 – Standard Practices for Sampling Water, Pages 110-116, 1995.

Closed Construction/Demolition Landfill Washington State Penitentiary Walla Walla, WA, Prepared for the Washington State Department of Corrections, June 23, 1995.

Draft Remedial Investigation Feasibility Study (RI/FS) Report, Washington State Penitentiary, Walla Walla, WA, Prepared for the Washington State Department of Corrections, April 2012.

EPA Guidance Documents on Preparing Quality Assurance Project Plans, U.S. Environmental Protection Agency, EPA/600/4-98/018, EPA QA/G5, February 1998.

Guidance for Data Quality Assessment – Practical Methods for Data Analysis, U.S. Environmental Protection Agency, EPA 600/R-96/084, EPA EZ/G9, QA97 Version, January 1998.

Guidance for Remediation of Petroleum Contaminated Sites, Washington State Department of Ecology, Publication 10-09-057, September 2011.

Guidance for the Preparation of Standard Operation Procedures (SOPs) for Quality-Related Documents, U.S. Environmental Protection Agency, EPA 600/R-96/027, EPA QA/G6, November 1995.

Guidance on Preparation of Laboratory Quality Assurance Plans, U.S. Environmental Protection Agency, EPA 910/9-92-032, October 1992.

Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies, Washington State Department of Ecology, Publication No. 04-03-030, July 2004.

Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures, Puls, R.W., and Barcelona, M.J., U.S. Environmental Protection Agency, Groundwater Issue Paper EPA/540/S-95/504, 12 p, April, 1996.

Model Toxics Control Act, Washington State Department of Ecology, Washington Administrative Code 173-340.

Preliminary Assessment Washington State Penitentiary Narrative Report, Prepared by Phil Leinart, Hydrologist Toxics Cleanup Program, Ecology, October 2000.

Preliminary Hydrogeologic Evaluation-Construction Demolition Landfill, Washington State Penitentiary, Walla Walla, Washington, Prepared for the Washington State Department of Corrections, September 3, 1998.

Samplers Guide to the Contract Laboratory Program, U.S. Environmental Protection Agency, EPA/540/R-06/032, PB 96-963411.

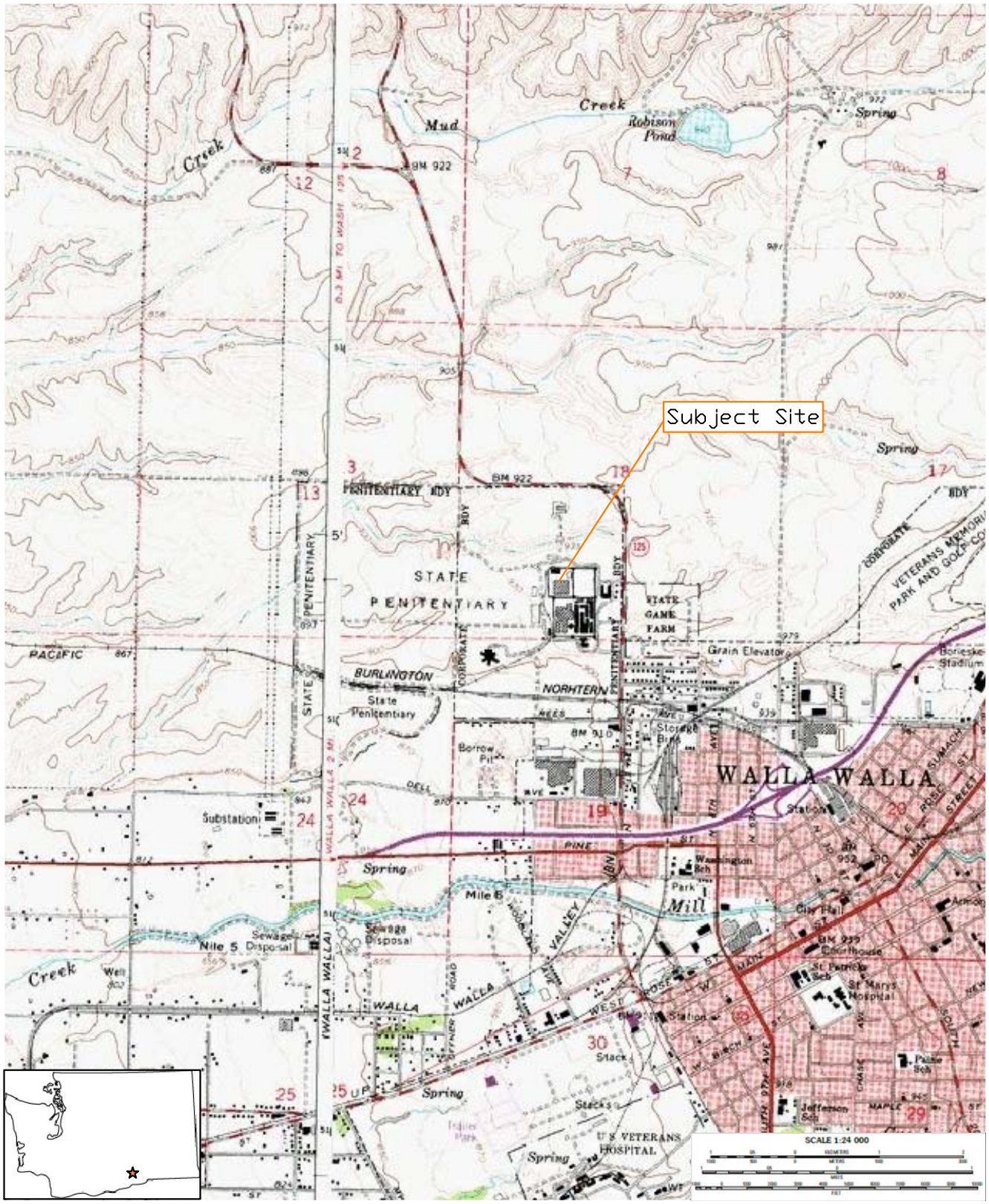
Standard Methods for the Examination of Water and Wastewater, 18th Edition, U.S. Environmental Protection Agency approved, prepared by the American Public Health Association, the American Water Works Association, and the Water Environment Federation.

Standard Operating Procedure for Purging and Sampling Monitoring Wells plus Guidance on Collecting Samples for Volatiles and other Organic Compounds, Washington State Department of Ecology, Environmental Assessment Program, Version 2.0, EAP078, January 27, 2014.

Sudbury Road Landfill Site Contaminant Source Identification/Assessment Report, Prepared under an agreement between Ecology and the U.S. Environmental Protection Agency, June 1999.

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, U.S. Environmental Protection Agency, EPA SW-846.

FULCRUM
environmental consulting



Topographic image provided by USGS

Fulcrum Environmental Consulting, Inc.
406 North Second Street, Yakima, Washington
p: 509.574.0839 f: 509.575.8453
Sampling Analysis Plan. 161801. LMW. 092116

1313 North 13th Avenue
Walla Walla, Washington

Site Location Map

FIGURE
1

FULCRUM
environmental consulting

Legend

- Sudbury Road Landfill Groundwater Monitoring Well
- Washington State Penitentiary Groundwater Monitoring Well

N

Fulcrum Environmental Consulting, Inc.
406 North Second Street, Yakima, Washington 98901
p: 509.574.0839 f: 509.575.8453 efulcrum.net
Sampling Analysis Plan. 161801. LMW.091616

1313 North 13th Avenue
Walla Walla, Washington

Site Map

FIGURE
2