MOSCOW
Urban Renewal Agency

Meeting Agenda: Thursday, July 18, 2024, 7:30 a.m.

City of Moscow Council Chambers • 206 E 3rd Street • Moscow, ID 83843
(A) = Board Action Item

1. **Consent Agenda (A)** - Any item will be removed from the consent agenda at the request of a member of the Board and that item will be considered separately later.
   - **A.** Minutes from June 20, 2024
   - **B.** Finance Committee Minutes from July 3, 2024
   - **C.** June 2024 Payables
   - **D.** June 2024 Financials

   ACTION: Approve the consent agenda or take such other action deemed appropriate.

2. **Public Comment**
   Members of the public may speak to the Board regarding matters NOT on the Agenda nor currently pending before the Moscow Urban Renewal Agency. Please state your name and resident city for the record and limit your remarks to three minutes.

3. **Sixth and Jackson Street Property Groundwater Monitoring Report (A) – Cody Riddle**
   Elevated ammonia and nitrate concentrations in the Agency's property at Sixth and Jackson have been monitored since 2016. Alta Science & Engineering has completed their site assessment of the property and will provide the Board with a summary of their Remediation Alternatives Analysis (RAA) Technical Memorandum.
   ACTION: Receive the report and accept the recommended remediation clean-up alternative; or take other action as deemed appropriate.

4. **General Agency Updates – Cody Riddle**
   - General agency business

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MOSCOW
Urban Renewal Agency

Meeting Minutes: June 20, 2024, 7:30 a.m.

City of Moscow Council Chambers • 206 E 3rd Street • Moscow, ID 83843

Commissioners Present	Commissioners Absent	Staff in Attendance
Steve McGeehan, Chair	Mark Beauchamp	Cody Riddle, Executive Director
Drew Davis	Sandra Kelly	Jennifer Fleischman, Clerk
Tom Lamar		Renee Tack, Treasurer
Alison Tompkins		
Nancy Tribble		

McGeehan called the meeting to order at 7:29 a.m.

1. Consent Agenda (A)

Any item will be removed from the consent agenda at the request of any member of the Board and that item will be considered separately later.

- ***A.** Minutes from June 6, 2024*
- ***B.** May 2024 Payables*
- ***C.** May 2024 Financials*

Tompkins moved for approval of the consent agenda as written, seconded by Davis. Vote by Acclamation: Ayes: Davis, McGeehan, Tompkins, Tribble (4). Nays: None. Abstentions: Lamar (1). Motion carried.

2. Public Comment

Members of the public may speak to the Board regarding matters NOT on the Agenda nor currently pending before the Moscow Urban Renewal Agency. Please state your name and resident city for the record and limit your remarks to three minutes.

None.

3. Preliminary Review of FY2025 MURA Budget & Capital Improvement Plan (A) – Cody Riddle

Through the Agency's strategic planning process, a 5-year capital improvement plan (CIP) is developed to set a framework for long-term financial planning related to public investments within the Legacy Crossing District. The CIP is updated each year to reflect new projects that have been identified, and to keep the CIP current. Staff has prepared an update to the CIP for the 2025-2029 fiscal years along with the draft FY2025 budget documents for the Board's review and direction. The public hearing on the budget has been set for the meeting on August 1st, 2024.

Riddle presented the draft FY2025 Budget and Capital Improvement Plan, as described above, and highlighted some differences between the current and the upcoming year. There was a brief review of future development projects that the Agency will contribute to.

Lamar arrived at 7:35 AM.

The anticipated cost for Idaho Counties Risk Management Program (ICRMP) insurance has increased since the draft budget was summarized, and that will be reflected in the budget document that goes before the Finance

Committee for review. There was a conversation about the ballooning payments on the Latah County repayment schedule.

Tribble moved for approval of the draft FY2025 budget and capital improvement plan as presented, seconded by Lamar. Roll Call Vote: Ayes: Unanimous (5). Nays: None. Abstentions: None. Motion carried.

4. General Agency Updates – Cody Riddle

- *General agency business*
  - The Department of Environmental Quality was unavailable to attend the meeting today, but will plan to be at the second regular meeting in July.
  - The Agency will start strategic planning sometime in late summer or early fall.
  - The regular meeting scheduled for July 4th, 2024 will be cancelled.

The meeting adjourned at 7:45 a.m.

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Steve McGeehan, Agency Chair Date

Moscow Urban Renewal Agency

Finance Committee Meeting Minutes: Wednesday, July 3, 2024, 9:00 a.m.

City of Moscow Council Chambers • 206 E 3rd Street • Moscow, ID 83843

Committee Members Present	Committee Members Absent	Staff in Attendance
Steve McGeehan, Chair	Nancy Tribble	Cody Riddle, Executive Director
Jenny Ford		Renee Tack, Treasurer
Dave Kiblen		Jennifer Fleischman, Clerk
Jon Kimberling		

The meeting was called to order at 9:02 a.m.

1. Election of Finance Committee Officers (A) – Cody Riddle

Historically, the Finance Committee has elected members to the positions of Chair and Vice Chair at the first meeting of the Committee each year.

Riddle informed the Committee that they will need to nominate and elect a Chair and Vice Chair. McGeehan expressed interest in serving as Chair again but another Vice Chair would need to be selected, as Beauchamp is not on the Committee this year.

Kimberling moved to elect Steve McGeehan as Chair and Nancy Tribble as Vice Chair. Kiblen seconded the motion for the 2024 election of Finance Committee officers. Vote by Acclamation; Ayes: Unanimous (4). Nays: None. Abstentions: None. Motion carried.

2. Review of Proposed FY2025 Budget (A) – Cody Riddle

Staff has prepared the draft FY2025 Budget and associated Capital Improvement Plan for the Committee's review and recommendation.

Riddle presented the proposed FY25 budget and Capital Improvement Plan, and offered to answer any questions from the Committee. The members had a discussion regarding the Agency revenue and the Sixth & Jackson Street property.

Kiblen moved to recommend the Agency Board approve the FY2025 Budget and accompanying Capital Improvement Plan, and Ford seconded the motion. Vote by Acclamation; Ayes: Unanimous (4). Nays: None. Abstentions: None. Motion carried.

The meeting adjourned at 9:31 a.m.

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Steve McGeehan, Chair Date

Moscow Urban Renewal Agency

Balance Sheet
June 30, 2024

	Total Funds
ASSETS	
Cash	19,821
Investments - LGIP	3,394,177
Investments-Zions Debt Reserve	44,536
Other Assets	5,260
Land	679,420
Total Assets	$ 4,143,214
LIABILITIES	
Series 2010 Bond - due within one year	37,000
Latah County payback agreement - due within one year	5,000
Series 2010 Bond - due after one year	121,000
Latah County payback agreement - due after one year	74,537
Total Liabilities	237,537
FUND BALANCES	
Net Investment in Capital Assets	521,420
Restricted Fund Balance	44,312
Unrestricted Fund Balance	3,339,945
Total Fund Balance	3,905,677
Total Liabilities and Fund Balance	$ 4,143,214

June-24

Checks by Date

MOSCOW Urban Renewal Agency

Check Number	Vendor	Description	Check Date	Check Amount
4941	UAVISTA	Avista Utilities	06/06/2024	
	1563734669-06172024	May '24 Electric for Legacy Property		51.69
Total for Check Number 4941:				51.69
4942	UCITYMOS	City of Moscow	06/06/2024	
	115911-05312024	May '24 Utilities 6th & Jackson		331.47
Total for Check Number 4942:				331.47
4943	UCITYMOS	City of Moscow	06/13/2024	
	2400002187	City Admin Fees Jun'24		4,750.42
Total for Check Number 4943:				4,750.42
Total bills for June 2023:				**$ 5,133.58**

June-24

Accounts Payable Checks for Approval

Check	Check Date	Fund Name	Vendor	Void	Amount
4941	06/06/2024	Moscow Urban Renewal Agency	Avista Utilities		51.69
4942	06/06/2024	Moscow Urban Renewal Agency	City of Moscow		331.47
4943	06/13/2024	Moscow Urban Renewal Agency	City of Moscow		4,750.42
			Report Total:	$ -	5,133.58

Steve McGeehan, Chairperson

Accounts payable expenditures as contained herein were made in compliance with the duly adopted budget for the current fiscal year and according to Idaho law.

Cody Riddle, Executive Director

Renee Tack, Treasurer

General Ledger
Expense vs. Budget

June-24

MOSCOW Urban Renewal Agency

Account	Description		Amended Budget		Period Amt		End Bal		Variance	% Budget Used
	URA General Fund									
890-880-642-00	Administrative Services	$	57,005.00	$	4,750.42	$	42,753.78	$	14,251.22	75.00%
890-880-642-15	Professional Services-Other	$	5,000.00	$	-	$	1,275.00	$	3,725.00	25.50%
890-880-642-20	Professional Services-Auditing	$	5,871.00	$	-	$	5,950.00	$	(79.00)	101.35%
890-880-642-89	Professional Services	$	525.00	$	-	$	19.95	$	505.05	3.80%
890-880-644-10	Advertising & Publishing	$	500.00	$	-	$	84.80	$	415.20	16.96%
890-880-668-10	Liability Insurance-General	$	1,950.00	$	-	$	2,172.00	$	(222.00)	111.38%
	Contractual	$	70,851.00	$	4,750.42	$	52,255.53	$	18,595.47	73.75%
890-880-631-10	Postage Expense	$	100.00	$	-	$	-	$	100.00	0.00%
890-880-631-20	Printing and Binding	$	400.00	$	-	$	-	$	400.00	0.00%
890-880-647-10	Travel & Meetings-General	$	500.00	$	-	$	-	$	500.00	0.00%
890-880-649-10	Professional Development	$	500.00	$	-	$	-	$	500.00	0.00%
890-880-669-10	Misc. Expense-General	$	500.00	$	-	$	22.50	$	477.50	4.50%
	Commodities	$	2,000.00	$	-	$	22.50	$	1,977.50	1.13%
	URA General Fund - Total	$	72,851.00	$	4,750.42	$	52,278.03	$	20,572.97	71.76%
	URA Legacy District									
890-895-642-10	Professional Services-Legacy	$	5,150.00	$	-	$	-	$	5,150.00	0.00%
890-895-642-12	Land Sale Expense-Legacy	$	2,060.00	$	-	$	-	$	2,060.00	0.00%
890-895-644-10	Ad. & Marketing Expense-Legacy	$	1,030.00	$	-	$	-	$	1,030.00	0.00%
	Contractual	$	8,240.00	$	-	$	-	$	8,240.00	0.00%
890-895-647-10	Travel & Meetings-Legacy	$	515.00	$	-	$	-	$	515.00	0.00%
890-895-652-10	Heat, Lights & Utilities	$	4,635.00	$	383.16	$	3,109.93	$	1,525.07	67.10%

890-895-658-51	Development Participation	$	870,000.00	$	-	$	-	$	870,000.00	0.00%
890-895-669-10	Misc. Expense-Legacy	$	515.00	$	-	$	-	$	515.00	0.00%
890-895-675-00	Fiscal Agent Trustee fees	$	1,500.00	$	-	$	-	$	1,500.00	0.00%
890-895-676-15	Latah County Reimb. Agreement	$	5,000.00	$	5,000.00	$	5,000.00	$	-	100.00%
890-895-676-17	Owner Participation Agreements	$	63,490.00	$	-	$	22,712.62	$	40,777.38	35.77%
	Commodities	$	945,655.00	$	5,383.16	$	30,822.55	$	914,832.45	3.26%
890-895-890-00	Transfer To: General Fund	$	72,851.00	$	-	$	-	$	72,851.00	0.00%
	Transfers To	$	72,851.00	$	-	$	-	$	72,851.00	0.00%
890-895-900-11	Contingency - Legacy	$	15,000.00	$	-	$	-	$	15,000.00	0.00%
	Contingency	$	15,000.00	$	-	$	-	$	15,000.00	0.00%
	URA Legacy District - Total	$	1,041,746.00	$	5,383.16	$	30,822.55	$	1,010,923.45	2.96%
890-892-790-01	Bond Principal - Legacy	$	37,000.00	$	-	$	-	$	37,000.00	0.00%
890-892-791-01	Bond Interest - Legacy	$	6,936.00	$	-	$	415.48	$	6,520.52	5.99%
	Debt Service - Total	$	43,936.00	$	-	$	415.48	$	43,520.52	0.95%
890-892-900-01	Ending Fund Bal - Assigned	$	999,103.00	$	-	$	-	$	999,103.00	0.00%
890-892-990-05	Ending Fund Bal - Restricted	$	49,752.00	$	-	$	-	$	49,752.00	0.00%
890-899-990-00	Ending Fund Bal - Unassigned	$	190,391.00	$	-	$	-	$	190,391.00	0.00%
	Ending Fund Balance - Total	$	1,239,246.00	$	-	$	-	$	1,239,246.00	0.00%
TOTAL	Moscow Urban Renewal Agency	$	2,397,779.00	$	10,133.58	$	83,516.06	$	2,314,262.94	3.48%

General Ledger

Revenue Analysis

June 2024

Account Number	Description	Budgeted Revenue	Period Revenue	YTD Revenue	Variance	Uncollected Bal	% Avail/Uncollect	% Received
890	**Moscow Urban Renewal Agency**							
890-000-410-01	Property Taxes - Legacy	$ 988,278.00	$ 46,394.41	$ 710,751.80	$ 277,526.20	$ 277,526.20	28.08%	71.92%
890-000-471-00	Investment Earnings	$ 45,000.00	$ 14,758.08	$ 106,881.67	$ (61,881.67)	$ (61,881.67)	-137.51%	237.51%
890-000-498-96	Transfer In: Legacy	$ 72,851.00	$ -	$ -	$ 72,851.00	$ 72,851.00	100.00%	0.00%
890	**Moscow Urban Renewal Agency**	**$ 1,106,129.00**	**$ 61,152.49**	**$ 817,633.47**	**$ 288,495.53**	**$ 288,495.53**	**26.08%**	**73.92%**
Revenue Total		**$ 1,106,129.00**	**$ 61,152.49**	**$ 817,633.47**	**$ 288,495.53**	**$ 288,495.53**	**26.08%**	**73.92%**

Alta Science & Engineering, Inc.

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T E C H N I C A L   M E M O R A N D U M

To:	Steve Gill, IDEQ Derek Young, IDEQ
cc:	Dana Harper, IDEQ
From:	Brett McLees, Boise, Idaho Robin Nimmer, Moscow, Idaho
Date:	May 31, 2024
Alta Project No.:	23114.006
IDEQ Contract No.:	K305 Task Order 69-A
Subject:	**Remediation Alternatives Analysis for the 6th and Jackson Street Property – Technical Memorandum**

Executive Summary

The overall goal of this Remediation Alternatives Analysis (RAA) for the Moscow Urban Renewal Agency's (URA) 6th and Jackson Street property in Moscow, Idaho is to reduce or eliminate exposures to physical, environmental, and health hazards at the Site for the proposed Site use. The current and anticipated future use of the Site is non-residential, however due to the varying nature of the proposed Site use both residential and non-residential was considered in the evaluation cleanup objectives. In addition, the following pathways were considered in the evaluation: direct contact, inhalation from vapor intrusion, ingestion, and protection of groundwater. Ammonia and Nitrate in groundwater exceeded the maximum Site-specific cleanup concentrations on site in MW-6 (farthest onsite downgradient well). The remedial goal is to prevent off-site migration and remediate groundwater to below MCLs and Site-specific cleanup criteria.

Remediation actions at the Site must provide for adequate protection of human health and the environment based on the current and future uses of the property. Remediation target levels will be defined by U.S. Environmental Protection Agency (EPA) MCLs and Site-specific cleanup criteria.

This RAA was performed to consider a range of reasonable and proven response actions and remediation alternatives based on contaminant concentrations, Site characteristics, current and proposed Site use, remediation goals, associated human health hazards, and potential exposure pathways.

Alta identified five remediation alternatives:

1. In-situ biological nitrification treatment.
2. A combination of contaminated soil removal with monitored natural attenuation.
3. A combination of excavation and biological nitrification treatment.
4. A combination phytoremediation and water aeration.

5. No-Action.

Conclusions & Recommendations

Alternatives 1 through 4 were similarly ranked yet they each score differently within the listed evaluation categories. Alternatives 1 and 3 have a higher overall long-term effectiveness but are much more costly and produce higher disturbance to location operations, while alternative 4 has lower long-term effectiveness. Alternatives 4 and 5 appear to be the least effective alternatives. Alternative 1, in-situ injection of a biological nitrification agent, is the most cost-effective alternative in combination with having a relatively high likelihood of success (depending on the pilot study) while maintaining limited disturbance to location operations. Though, if concentrations in groundwater do not decrease over a span of a year, additional injections may be necessary to promote attenuation.

Based on site and budgetary constraints, Alta recommends consideration of clean-up alternative 1, ***In-situ Biological Nitrification Treatment,*** which includes one year of subsequent groundwater monitoring to determine level of effectiveness to meet remediation goals.

1 Introduction

As part of the ongoing assessment for the project known as 6th & Jackson located at W. 6th Street and Jackson Street, Moscow, Idaho (Site), Alta Science & Engineering, Inc. (Alta) was tasked with creating a Remediation Analysis Alternatives (RAA) report for the Site. The purpose of this RAA is to briefly summarize information about the Site and provide remediation options to address contamination issues associated with the Site. The remedial alternatives are evaluated based on protection of human health and the environment, ease of implementation, cost of remediation, sustainability, ability to meet proposed land use, and compliance with applicable standards.

2 Site History and Previous Assessments

The 0.84-acre Site is located southwest of the intersection between W. 6th Street and Jackson Street in Moscow, Idaho, between Moscow's historic downtown district and the University of Idaho Campus. The Moscow Urban Renewal Agency (URA) currently owns the Site.

Historically, industrial agricultural businesses and storage of agricultural chemicals supported by the former railroad corridor occupied the Site. Most recently, a retail produce business operated on the northeast corner of the Site from about 2000 through 2010. All Site buildings have been removed and the Site is currently vacant and mostly unpaved, with the exception of a small paved area along the southwestern boundary.

Strata, Inc. (Strata) conducted Phase I Environmental Site Assessments (ESAs) in 2008 and 2010 which identified bulk storage of agricultural chemicals and a small heating oil underground storage tank (UST) in the eastern area of the site as recognized environmental conditions (RECs; Strata 2008 and 2010). Tetra Tech, Inc. (Tetra Tech) conducted a Phase II ESA in 2012 for soil and groundwater contamination based on these RECs (Tetra Tech 2013). They divided the site into three decision units (DUs; DU1, DU2, and DU3) based on historical practices at the Site. They further divided DU2 and DU3 into two and four subunits (SUs), respectively. Tetra Tech conducted the following work (Figure 1):

- Collected 20-point multi-increment surface soil samples from land surface to 6 inches below ground surface (bgs) from each of the SUs. The lab analyzed soil samples for herbicides, pesticides, and Resource Conservation and Recovery Act (RCRA) 8 metals.
- Advanced four soil borings at the monitoring well locations and collected subsurface soil samples. The lab analyzed soil samples for herbicides, pesticides, and RCRA 8 metals.
- Installed four monitoring wells. The lab analyzed groundwater samples for polycyclic aromatic hydrocarbons (PAHs), herbicides, RCRA 8 metals, nutrients (nitrate/nitrite as nitrogen, ammonia, and total phosphorus as phosphate), and pesticides.
- Removed the UST and collected five soil samples from the bottom and sidewalls of the UST basin. The lab analyzed the soil samples for volatile organic compounds (VOCs) and PAHs.

Tetra Tech's Phase II ESA findings indicated that several contaminants of potential concern (COPCs) in surface soil, subsurface soil, and groundwater exceeded their corresponding Idaho Initial Default Target Levels (IDTLs) listed in Appendix A of IDEQ's Risk Evaluation Manual (REM) (IDEQ 2018). As a result, Tetra Tech conducted a Site-specific risk assessment using the IDEQ REM (IDEQ 2018). The risk assessment analyzed the risk and hazard that contaminants found in the soil and groundwater may have on human health and the environment. Tetra Tech completed the Site-specific risk assessment on the entire site to obtain Remedial Action Target Levels-Scenario 1 (RATLs-1: residential conditions) for the COPCs. Site-specific risk assessment findings indicated that Dichlorodiphenyltrichloroethane (DDT) in the southern half of DU2 (the central site bulk chemical storage and railroad spur) and dieldrin in the northern half of DU2 were contaminants of concern (COCs) in soil less than 6 inches in depth.

Results from the Tetra Tech Phase II ESA groundwater sampling indicate the IDTLs are exceeded for nitrite/nitrate as nitrogen at all wells except S2-MW-01 (located in the southeast of the site), arsenic at all wells, and lead at S2-MW-03 (located in the northwest of the site). They calculated the groundwater gradient to be towards the northwest. Concentrations of nitrite/nitrate as nitrogen are highest at well S2-MW-04 (up-gradient well) located near the property boundary in the southwest area of the site, and concentrations decline down-gradient at well S2-MW-03. This suggests an up-gradient source. Well S2-MW-02 has the highest concentrations of total phosphorus and ammonia, neither of which has an IDTL. The source of nutrient concentrations at this well was unknown. Arsenic concentrations at all site wells and lead at S2-MW-03 are near the laboratory limits of quantitation.

TerraGraphics Environmental Engineering, Inc. (TerraGraphics) conducted follow-up sampling of DU2 in November 2013 to evaluate pesticide concentrations with depth to assist in guiding the remedial strategy. TerraGraphics divided DU2 into four SUs (SU-A to SU-D, from north to south) and collected composite samples below a depth of 6 inches from five discrete samples within each SU (TerraGraphics 2014a). The laboratory analyzed samples for DDT from discrete depths from 6 to 48 inches and dieldrin in the 6-to-12-inch depth. The laboratory did not detect dieldrin but did detect DDT in all samples except the sample from 36 to 48 inches bgs in SU-C. DDT and dieldrin concentrations in samples deeper than 6 inches did not exceed risk standards.

In a Memorandum dated August 1, 2014, TerraGraphics identified the following data gaps remaining from the previous studies (TerraGraphics 2014b).

- Nutrient concentrations in soil throughout DU3 and the above ground storage tank (AST) area of DU2.
- RCRA 8 metals concentrations in soil in the southern area of DU3.
- Pesticide concentrations in soil in DU3.
- Groundwater concentrations of RCRA 8 metals, pesticides, and nutrients in groundwater at existing wells and at two new wells: DU2 near the AST area and DU3 in the northwest corner of the site.

In 2014, the City of Moscow (City), contracted with Alta Science & Engineering, Inc. (Alta) to fill data gaps identified during the assessment activities during the previous assessment. Laboratory analysis indicates that several COCs were detected at concentrations in soil and groundwater which exceeded IDTL.

In 2015, the City contracted with Alta to implement the remedial action strategy presented in the Final Analysis of Brownfields Cleanup Alternatives [ABCA] and Remediation Work Plan [ABCA/Work Plan] for 217 & 317 W. 6th Street Moscow, Idaho (TerraGraphics 2015a) to address nitrate and ammonia concentrations in shallow groundwater and soils.

The ABCA/Work Plan identified remediation standards that ensure current or probable future risk to human health or the environment are eliminated or reduced, based on present and reasonably anticipated future uses of the Site. This work was completed as part of the Greater Moscow Area Coalition (the Coalition) Assessment Grant BF-00J24101 project and in compliance with the Voluntary Cleanup Program (VCP) agreement between the Idaho Department of Environmental Quality (IDEQ) and the Moscow URA.

In late 2015 and early 2016, Alta implemented remedial actions, including soil excavation, groundwater extraction system installation, and sodium lactate amendment injections (TerraGraphics 2016). The groundwater extraction system, which has been operating since February 2016, consists of three wells (EW-1, EW-2, and EW-3), each equipped with a dedicated 12-volt submersible pump which recovers groundwater from the well and discharges it into the City sanitary sewer. Alta designed the extraction system to remove nitrate- and ammonia-impacted groundwater and prevent it from migrating off the Site.

Figure 1. Site Location Map

3 Development of Remediation Goals and Objectives

The following sections outline remediation goals and objectives for the Site.

3.1 Current Land Use

The Site is approximately 0.84 acres in size and is currently zoned “Exempt Property”. The Site is currently vacant, but historically has operated as industrial agricultural businesses and storage of agricultural chemicals. The Site is not connected to city water or sewer services.

3.2 Anticipated Future Land Use

Remediation target levels vary depending on whether the land use is residential or non-residential as defined by IDEQ’s Idaho Risk Evaluation Manual for Petroleum Releases (Petro REM) (IDEQ 2018). Therefore, evaluating current and reasonably likely future land uses at the Site is critical to determining cleanup target levels and potential exposure points, exposure pathways, and exposure factors. Remediation target levels will likely use both residential and non-residential variables due to the varying nature of the proposed Site use.

3.3 Regional Land Use

Moscow is located in Latah County, often referred to as “the Palouse.” The Palouse produces a large percentage of wheat, lentils, peas, oats, and barley in the U.S. While the majority of the land within Latah County is used for agricultural processes, the University of Idaho (located in Moscow, Idaho) and Washington State University (located 8 miles away in Pullman, Washington) are also an integral element of the community. The community, with a population of approximately 26,249 (https://www.census.gov/quickfacts/fact/table/moscowcityidaho/LND110210, accessed April 24, 2024), is located on US Highway 95.

Positioned directly south of the Site is Silos & Social, a restaurant built beneath old grain silos. To the north is Moscow Alehouse and Jimmy John’s Sandwiches. To the west is a large commercial multi-complex building consisting of multiple businesses. To the east Highway 95 separates the Site from Banner Bank.

3.4 Water Use

Currently, there are no production wells or drinking water wells located on Site. There are currently four shallow monitoring wells located on Site (MW-1 [upgradient], MW-3, MW-3A, and MW-6) used only for water quality monitoring. Alta field crew measured depth to groundwater in all four wells during the October 2023 groundwater characterization.

3.5 Site Hazards and Contaminants of Concern

Site sampling has shown that nitrate and ammonia in groundwater are present at the Site in concentrations that exceed EPA’s MCL for Nitrate and established Site-specific cleanup criteria for ammonia and are the recognized Site COCs. The following sections provide information on those COCs.

3.6 Remediation Goals and Objectives

The overall goal of this RAA is to reduce or eliminate exposures to physical, environmental, and health hazards at the Site for the proposed Site use. The current and anticipated future use of the Site is non-residential, however due to the varying nature of the proposed Site use both residential and non-residential was considered in the evaluation cleanup objectives. In addition, the following pathways were considered in the evaluation: direct contact, inhalation from vapor intrusion, ingestion, and protection of groundwater. Impacted groundwater in excess of the MCLs and Site-specific cleanup criteria was discovered on site to the extent of MW-6 (farthest onsite downgradient well) and remediation goals therefore consider both onsite and offsite impacts. The goal will be achieved by remediating contaminated groundwater to below MCLs and Site-specific cleanup criteria.

Remediation actions at the Site must provide for adequate protection of human health and the environment based on the current and future uses of the property. Cleanup target levels will be defined by EPA MCLs and Site-specific cleanup criteria.

3.7 Identification of Remediation Alternatives

The following analysis was performed to consider a range of reasonable and proven response actions and remediation alternatives based on contaminant concentrations, Site characteristics, current and proposed Site use, remediation goals, associated human health hazards, and potential exposure pathways. This section presents a compilation of potentially applicable technologies for the remediation of the identified COCs described in Section 3. The objective of this analysis is to identify alternatives to be evaluated further in Section 4.

For each of the potentially applicable alternatives, a brief description of the alternative and a short discussion of its advantages and disadvantages are presented.

Five options are considered for remediation of the Site:

1. In-situ biological nitrification treatment.
2. A combination of contaminated soil removal with monitored natural attenuation.
3. A combination of excavation and biological nitrification treatment.
4. A combination phytoremediation and water aeration.
5. No-Action.

3.7.1 Clean-up Alternative 1 – In-situ Biological Nitrification

Description

In-situ biological nitrification is a process used to treat ammonia in various environmental settings, including wastewater treatment plants, agricultural systems, and contaminated soils. It involves the sequential activity of specialized bacteria to convert ammonia (NH_4^+) to nitrate (NO_3^-).

One commonly used form of liquid biological nitrification is VitaStim Dynamic Duo made by Aquafix, Inc., used exclusively in municipal wastewater streams and plants to reduce ammonia and nitrate levels (Attachment A). VitaStim Dynamic Duo is a two-part product that is comprised of both ammonia assimilators and nitrifiers. The ammonia assimilators contain heterotrophic nitrifying bacteria that utilize both carbon and a high fraction of nitrogen. The nitrifiers contain high concentrations of ammonia and nitrite oxidizing bacteria as well as micronutrients to stimulate growth and reproduction of nitrifying bacteria. This two-step process contains bacteria to first oxidize ammonia to nitrite, and second, to oxidize nitrite to nitrate.

A pilot test is necessary to evaluate the effectiveness of this product in a natural system. The pilot test would involve two processes:

1) introducing a conservative tracer at the Site to evaluate groundwater flow, gradient, and system performance while the groundwater extraction system is running and

2) introduce VitaStim Dynamic Duo to the three onsite extraction wells (EW-1, EW-2, and EW-3, Figure 2).

Prior to and after the application of VitaStim Dynamic Duo, test the downgradient compliance wells (MW-3, MW-3A, and MW-6) and extraction wells for ammonia and nitrate at day 0, 4, 10, and 14 to evaluate the effectiveness of this technology in a natural system. After the pilot test is complete and depending on results, a Site-wide remediation plan would be developed and recommended.

Advantages

- Reduces the anticipated clean-up times required for MNA and other remedial options.
- Low cost to implement and continue with treatment.
- This remedial method can be implemented with minimal disturbance to Site operations. The anticipated number of days to complete this work is approximately 14 business days. Alta will coordinate Site activities to help minimize disturbance to the surrounding business.
- Requires no removal, treatment, or storage considerations for groundwater or soil.
- Based on Site-specific groundwater monitoring from 2014 to 2024, groundwater parameters including dissolved oxygen and oxidation reduction potential (ORP) resulted in low to moderate levels indicating an aerobic environment or oxidizing environment needed for bacteria growth and support.

Disadvantages

- May require a pilot test to determine infiltration rates.
- This is a novel approach to utilize existing proven wastewater technologies in a natural system and as such requires a pilot study.
- Complex heterogeneous systems involving aquifer materials, soils, and groundwater can introduce potential treatment inefficiencies due to imperfect reactive conditions.

3.7.2 Clean-up Alternative 2 – Combination of Soil Excavation, Removal, and Monitored Natural Attenuation

Description

The previously identified contaminated soils will be excavated, removed, and land-farmed, and the resultant pit(s) will be backfilled and compacted with clean soil. The groundwater extraction system will continue to operate and groundwater will be monitored to ensure that any remaining contamination is not migrating offsite and that the overall contaminant mass is reducing over time.

Advantages

- Source of continued contamination at the Site will be removed.
- Could be done in conjunction with Site redevelopment activities to save costs.
- Leaves the groundwater extraction system in place and operational enhancing cleanup timeframe.
- Ongoing monitored natural attenuation (MNA) will provide information to aid in complete Site closure.
- Requires no removal, treatment, storage, or discharge considerations for groundwater.

Disadvantages

- It may not be possible to remove all contaminated soil from the Site. Institutional controls, such as land use restrictions, may be required to ensure the protection of human health and the environment by limiting exposure to any remaining COCs and protecting the integrity of the remedy.
- Temporary disturbance to Site operations will be high.
- Shallow groundwater may limit the depth of excavation.
- Potential cost to haul and store soils at a landfarm.
- Potential cost to replace existing monitoring wells.

3.7.3 Clean-up Alternative 3 – Combination of Soil Excavation, In-situ Biological Nitrification, and Monitoring Natural Attenuation

Description

The previously identified contaminated soils will be excavated, removed, and land-farmed, and the resultant pit will have an Oxygen Release Compound (ORC) placed on the floor of the excavation and will be backfilled with clean soil. A biological nitrification product will be introduced into the injection wells to reduce ammonia and nitrate levels in Site groundwater. ORC and the nitrification product will be implemented to accelerate aerobic conditions via biodegradation. The groundwater extraction system will continue to operate and groundwater will be monitored to ensure that any remaining contamination is not migrating offsite and that the overall contaminant mass is reducing over time.

Advantages

- Source of continued contamination at the Site will be removed.
- Could be done in conjunction with Site redevelopment activities to save costs.
- Leaves the groundwater extraction system in place and operational enhancing cleanup timeframe.
- Reduces the anticipated cleanup times required for MNA and other remedial options.
- Requires no removal, treatment, or storage considerations for groundwater.
- Adds two additional levels of treatment compared to Clean-up Alternative 1 alone.

Disadvantages

- There are additional costs to continue site monitoring.
- It may not be possible to remove all contaminated soil from the Site. Institutional controls, such as land use restrictions may be required to ensure the protection of human health and the environment by limiting exposure to any remaining COCs and protecting the integrity of the remedy.
- Temporary disturbance to Site operations will be high.
- Shallow groundwater may limit the depth of excavation.
- Potential cost to haul and store PCS at landfarm.
- Potential cost to replace existing monitoring wells and groundwater extraction system.

3.7.4 Clean-up Alternative 4 – Phytoremediation

Description

Phytoremediation is a means of removing, transforming, or binding contaminants in soil and groundwater through the use of plants, both as active and passive remediation tools. Plants can remediate contaminants through one or more of four processes:

1) phytotransformation,
2) phytoextraction,
3) phytostabilization, and
4) rhizofiltration.

Of these, phytotransformation is the process most active in plant removal of nitrogen compounds of interest. In addition to their ability to transform nitrogen compounds, some plants transpire great quantities of water. Thus, not only can plants remove certain types of contaminants, they can also act as groundwater extraction and flow control structures. Additionally, utilizing Site water for irrigation of these plants will accelerate remediation through plant groundwater uptake, but also through aeration and evaporation.

In addition, phytoremediation techniques generally meet with public acceptance due to the ease of understanding and a desire to see living things transform a contaminated site.

Advantages

- Low upfront cost but depending on cleanup timeframe, operation and maintenance (O&M) cost may be prohibitive.
- This cleanup method can be implemented with minimal disturbance to Site operations.
- This option requires no removal, treatment, storage, or discharge considerations for groundwater.
- Additional downtown greenspace for the community.

Disadvantages

- Depending on cleanup timeframe, O&M cost may be prohibitive.
- Time; Phytoremediation requires plantings to mature sufficiently to become effective at significant nitrogen removal. Sites that demand immediate action to protect drinking water supplies may not be able to wait for maturation of a planting.

- Depth of contamination may exceed the rooting depth of plants.
- Heavy, tight soils may limit rooting depth as well, even with species that are normally deep rooted, as can poorly drained soil conditions. Low permeability soils require high vacuum which may be costly.
- Some interactions among complex chemical, physical, and biological processes are not well understood, which may hinder the efficacy of this alternative.

3.7.5 Clean-up Alternative 5 – No Action

Description

The No-Action alternative assumes no remediation actions will be undertaken at the Site and must be considered as part of the comparative analysis process.

Advantages

- Cleanup costs of this alternative would be zero, although costs have already been incurred for Site investigations and monitoring.

Disadvantages

- This would require continued operation of the groundwater extraction system until such a time as the compliance well samples meet the compliance criteria specified in the Voluntary Remediation Work Plan per the Environmental Covenant.

Figure 2. Potential Injection Map

4 Detailed Analysis of Remediation Alternatives

4.1 Description of Evaluation Criteria

The remediation alternatives identified for the site (see Section 3) are evaluated in this section based on the following performance criteria:

1. Overall protection of human health and the environment
2. Ease of implementation
3. Cost of remediation
4. Sustainability – O&M and long-term effectiveness

The following subsections describing these performance criteria serve as a basis for conducting a comparative analysis of the proposed remedial alternatives.

4.1.1 Overall Protection of Human Health and the Environment

This criterion is used to evaluate whether human health and the environment are adequately protected. Human health protection includes reducing risk to acceptable levels, either by reducing contamination concentrations or eliminating potential routes for exposure by implementing specific training to meet regulatory requirements. Environmental protection includes minimizing or avoiding negative impacts to natural, cultural, and historical resources.

4.1.2 Ease of Implementation

Ease of implementation refers to the technical and administrative feasibility of carrying out an alternative and the availability of the required services and materials. The following factors are considered for each alternative:

- The likelihood of technical difficulties in constructing the alternative and delays due to technical problems.
- The potential for regulatory constraints to develop (e.g., as a result of uncovering buried cultural resources or encountering endangered species).
- The availability of necessary equipment, specialists, and provisions, as applicable.

4.1.3 Cost

This criterion considers the cost of implementing an alternative, including capital costs, O&M costs, opportunity costs, and monitoring costs.

4.1.4 Sustainability – O&M and Long-term Effectiveness

Sustainability includes an assessment for the potential need to replace the alternative's technical components in the long term. In addition, this criterion evaluates the ease of O&M procedures required for the Site.

4.2 Detailed Analyses of Alternatives

All of the proposed alternatives have the potential to provide for overall protection of human health and the environment and will be designed to remain in compliance with applicable federal, state, and local regulations. Since a No Action alternative results in following the Environmental Covenant, this alternative was not evaluated for the remediation alternatives.

4.2.1 Detailed Analysis of Alternative 1 – In-situ Biological Nitrification

4.2.1.1 Overall Protection of Human Health and the Environment

This alternative would accelerate the aerobic degradation of Site soil and groundwater contaminants.

4.2.1.2 Ease of Implementation

Depending on the pilot study findings, the Site already has four injection wells in the area of remaining soil contamination that could be utilized to implement this alternative. Permits may be required for the injection of an in-situ biological nitrification agent into the site groundwater.

4.2.1.3 Cost

The pilot study will drive the overall cost of this remediation alternative. Mobilization fees and laboratory fees would be incurred during groundwater monitoring events. The cost to implement the pilot study is between $15,000 and $20,000. Full scale injections could be as high as $50,000 to $60,000 along with groundwater monitoring costs estimated at $15,000 to $20,000 per year. Total cost for this alternative, with the pilot study and one year of quarterly monitoring, is estimated at $80,000 to $90,000.

4.2.1.4 Sustainability – O&M and Long-term Effectiveness

Quarterly groundwater monitoring may be needed to determine the effectiveness of the in-situ biological nitrification agent and to ensure that human health is adequately protected. Quarterly monitoring will need to be conducted until COCs meet MCLs and Site-specific cleanup criteria. Depending on the effectiveness of the remedial approach in meeting cleanup goals, additional injections may be necessary. Institutional controls may be removed from the Site once it reaches compliance with regulations or institutional controls may even be eliminated.

4.2.2 Detailed Analysis of Alternative 2 –Combination of Soil Excavation, Removal, and Monitored Natural Attenuation

4.2.2.1 Overall Protection of Human Health and the Environment

This alternative will remove the main source of Site contamination, as determined through Site testing and analysis. However, some contamination may remain at the Site and ongoing groundwater monitoring of natural attenuation processes will ensure that any remaining contamination does not migrate off-site and will provide data on the remaining amounts of contamination over time. Transportation of hazardous materials wastes also poses a potential, but negligible, short-term risk to human health and the environment.

4.2.2.2 Ease of Implementation

The Site area demonstrating the highest contamination has been delineated to the extent possible. Nearby contractors are available to excavate this area using a backhoe and transport the soil to the closest landfarm. Monitoring wells can be re-installed in the event they need to be removed during source removal.

4.2.2.3 Cost

Excavation and backfilling, landfarming, and monitoring well replacement costs are estimated at $280,000 to $310,000 for an area 80 by 70 feet, and 10 feet deep (2,000 cubic yards estimated), and subsequent groundwater monitoring costs are estimated at $15,000 to $20,000 per year if conducted quarterly. Total cost for this alternative, with one year of quarterly monitoring, is estimated at $295,000 to $330,000.

4.2.2.4 Sustainability – O&M and Long-term Effectiveness

Since the contamination source will be removed, the period of time for natural attenuation may be shortened which may lead to a reduced monitoring time frame. Since contamination data is known, institutional controls may be removed from the Site once it reaches compliance with regulations.

4.2.3 Detailed Analysis of Alternative 3 – Combination of Soil Excavation, In-situ Biological Nitrification, and Monitoring Natural Attenuation

4.2.3.1 Overall Protection of Human Health and the Environment

This alternative will remove the main source of Site contamination, as determined through Site testing and analysis. However, some contamination may remain at the Site and the introduction of an in-situ biological nitrification agent to the floor of the excavation and in the onsite injection wells will ensure accelerated aerobic biodegradation.

4.2.3.2 Ease of Implementation

The Site area demonstrating the highest contamination has been delineated to the extent possible. Nearby contractors are available to excavate this area and transport the soil to the closest landfarm. Monitoring wells can be re-installed in the event they need to be removed during source removal. Subsequent quarterly groundwater would be completed after removal activities.

4.2.3.3 Cost

Overall costs for this alternative will be higher since it combines the removal of the contamination source, the placement of in-situ biological nitrification agent, and ongoing monitoring to aid in Site closure. Excavation and backfilling, landfarming, and monitoring well replacement costs are estimated at $280,000 to $310,000 for an area 80 by 70 feet, and 10 feet deep (2,000 cubic yards estimated), in-situ biological nitrification agent has an estimated placement cost of $1,500 to $3,000, and groundwater monitoring costs are estimated at $15,000 to $20,000 per year. Total cost for this alternative, with one year of quarterly monitoring, is estimated at $296,500 to $333,000.

4.2.3.4 Sustainability – O&M and Long-term Effectiveness

Quarterly groundwater monitoring will also be needed to determine the effectiveness of the source removal and in-situ biological nitrification agent and to ensure that human health is adequately protected. Quarterly monitoring will need to be conducted until COCs meet MCLs and Site-specific cleanup criteria. Depending on the effectiveness of the remedial approach in meeting remediation goals, additional injections may be necessary. Institutional controls may be removed from the Site once it reaches compliance with regulations.

4.2.4 *Detailed Analysis of Alternative 4 – Phytoremediation*

4.2.4.1 Overall Protection of Human Health and the Environment

This alternative would enable plants at the surface to uptake nutrients. Since contaminated groundwater is present at depths greater than 10 feet bgs, this alternative would be ideal for shallow remediation but ineffective at treating contamination at depth unless Site water is utilized for irrigation.

4.2.4.2 Ease of Implementation

This alternative can be implemented with ease by simply planting vegetation at the surface and irrigating.

4.2.4.3 Cost

This alternative may be costly since the remediation would likely not be realized for many years. Overall costs are estimated at $15,000 to $20,000 to implement along with $10,000 to $15,000 per year in O&M and monitoring. Groundwater monitoring costs are estimated at $15,000 to $20,000 per year. Total cost for this alternative, with one year of quarterly monitoring, is estimated at $40,000 to $55,000.

4.2.4.4 Sustainability – O&M and Long-term Effectiveness

This alternative would be moderately effective for shallow soils. Once planted there would be minimal ongoing O&M efforts. Quarterly groundwater monitoring will be needed to determine the effectiveness of phytoremediation and to ensure that human health is adequately protected. Institutional controls may be removed from the Site once it reaches compliance with regulations.

5 Comparative Analysis of Remediation Alternatives

5.1 Alternative Ranking Criteria

Table 1 compares the analysis of the four proposed alternatives against the evaluation criteria. Alternatives with higher scores are considered better options for the owners. Rankings were made on a scale of “1” through “3” with:

- 1 = Low Success,
- 2 = Moderate or Average Success, and
- 3 = High Success.

Table 1. Comparative Analysis of Remediation Alternatives

Remediation Alternative	Overall Protection of Human Health and the Environment	Ease of Implementation	Cost-Effective Approach towards Remediation	Sustainability - O&M and Long-term Effectiveness	Total Score
1. In-situ Biological Nitrification.	2	3	2	2	9
2. Combination of soil excavation/removal and MNA.	3	2	1	2	8
3. Combination of soil excavation/removal, in-situ biological nitrification, and MNA.	3	2	1	3	9
4. Phytoremediation.	2	3	1	2	8
5. No-Action.	1	3	3	1	8

Notes: (1= Low Success, 2=Medium Success, 3=High Success)
(For Cost: 1=High Cost, 2=Medium Cost, 3=Low Cost)

5.2 Summary and Preferred Alternative

Alternatives 1 through 4 were similarly ranked yet they each score differently within the listed categories. Alternatives 1 and 3 have a higher overall long-term effectiveness but are much more costly and produce higher disturbance to location operations, while alternative 4 has lower long-term effectiveness. Alternatives 4 and 5 appear to be the least effective alternatives. Alternative 1, in-situ injection of a biological nitrification agent, is the most cost-effective alternative in combination with having a relatively high likelihood of success (depending on the pilot study) while maintaining limited disturbance to location operations. Though, if concentrations in groundwater do not decrease over a span of a year, additional injections may be necessary to promote attenuation.

Based on site and budgetary constraints, Alta recommends clean-up alternative 1, ***In-situ Biological Nitrification Treatment,*** which includes one year of subsequent groundwater monitoring to determine level of effectiveness to meet remediation goals.

6 References

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Attachment A

Fact Sheets