

**AGREEMENT FOR THE SUPPLY OF
WELL 24 WATER TREATMENT FILTER
PROJECT #11083.d**

THIS AGREEMENT FOR EQUIPMENT / SUPPLIES PROCUREMENT is made this _____ day of October, 2024, and entered into by and between the City of Meridian, a municipal corporation organized under the laws of the State of Idaho, hereinafter referred to as "CITY", 33 East Broadway Avenue, Meridian, Idaho 83642, and Kurita America, hereinafter referred to as "SUPPLIER", whose business address is 6600 94th Ave. N Minneapolis, Minnesota 55445.

INTRODUCTION

Whereas, the City has a need for WELL 24 FILTER; and

WHEREAS, the SUPPLIER is specially trained, experienced and competent to provide and has agreed to provide such equipment;

NOW, THEREFORE, in consideration of the mutual promises, covenants, terms and conditions hereinafter contained, the parties agree as follows:

TERMS AND CONDITIONS

1. Equipment / Supply Specifications & Requirements:

1.1 SUPPLIER shall supply the equipment, supplies and services to the City upon execution of this Agreement and receipt of the City's written notice to proceed, all items, and comply in all respects, as specified in the Request for Proposals titled "Well 24 Water Treatment Filter" and suppliers proposal dated August 8, 2024, which by this reference are incorporated herein, together with all addendums issued.

1.2 The SUPPLIER shall provide all equipment and services under this Agreement consistent with the requirements and standards established by applicable federal, state and city laws, ordinances, regulations and resolutions and the UCC. The SUPPLIER represents and warrants that it will perform its work in accordance with generally accepted industry standards and practices for the profession or professions that are used in performance of this Agreement and that are in effect at the time of performance of this Agreement.

2. Consideration

2.1 The SUPPLIER shall be compensated on a Fixed Price basis as provided in Attachment B "Payment Schedule" attached hereto and by reference made a part hereof, for the Not-To-Exceed amount of **\$861,150.00.**

2.2 The SUPPLIER shall provide the City with a detailed invoice upon delivery of all equipment and supplies, which the City will pay within 30 days of receipt of a correct invoice and approval by the City Project Manager. The City will not withhold any Federal or State income taxes or Social Security Tax from any payment made by City to SUPPLIER under the terms and conditions of this Agreement. Payment of all taxes and other assessments on such sums is the sole responsibility of SUPPLIER.

2.3 Except as expressly provided in this Agreement, SUPPLIER shall not be entitled to receive from the City any additional consideration, compensation, salary, wages, or other type of remuneration for services rendered under this Agreement., including, but not limited to, meals, lodging, transportation, drawings, renderings or mockups. Specifically, SUPPLIER shall not be entitled by virtue of this Agreement to consideration in the form of overtime, health insurance benefits, retirement benefits, paid holidays or other paid leaves of absence of any type or kind whatsoever.

3. Term:

3.1 This agreement shall become effective upon execution by both parties, and shall expire upon (a) completion of the agreed upon work, or (b) unless sooner terminated as provided below or unless some other method or time of termination is listed in Attachment A.

3.2 Should SUPPLIER default in the performance of this Agreement or materially breach any of its provisions, City, at City's option, may terminate this Agreement by giving written notification to SUPPLIER.

3.3 Should City fail to pay SUPPLIER all or any part of the compensation set forth in Attachment B of this Agreement on the date due, SUPPLIER, at the SUPPLIER's option, may terminate this Agreement if the failure is not remedied by the City within thirty (30) days from the date payment is due.

4. Termination:

If, through any cause, SUPPLIER, its officers, employees, or agents fails to fulfill in a timely and proper manner its obligations under this Agreement, violates any of the covenants, agreements, or stipulations of this Agreement, falsifies any record or document required to be prepared under this agreement, engages in fraud, dishonesty, or any other act of misconduct in the performance of this contract, or if the City Council determines that termination of this Agreement is in the best interest of CITY, the CITY shall thereupon have the right to terminate this Agreement by

giving written notice to SUPPLIER of such termination and specifying the effective date thereof at least fifteen (15) days before the effective date of such termination.

Notwithstanding the above, SUPPLIER shall not be relieved of liability to the CITY for damages sustained by the CITY by virtue of any breach of this Agreement by SUPPLIER, and the CITY may withhold any payments to SUPPLIER for the purposes of set-off until such time as the exact amount of damages due the CITY from SUPPLIER is determined. This provision shall survive the termination of this agreement and shall not relieve SUPPLIER of its liability to the CITY for damages.

5. Independent SUPPLIER:

5.1 In all matters pertaining to this agreement, SUPPLIER shall be acting as an independent SUPPLIER, and neither SUPPLIER nor any officer, employee or agent of SUPPLIER will be deemed an employee of CITY. Except as expressly provided in Attachment A, SUPPLIER has no authority or responsibility to exercise any rights or power vested in the City and therefore has no authority to bind or incur any obligation on behalf of the City. The selection and designation of the personnel of the CITY in the performance of this agreement shall be made by the CITY.

5.2 SUPPLIER, its agents, officers, and employees are and at all times during the term of this Agreement shall represent and conduct themselves as independent SUPPLIERS and not as employees of the City.

5.3 SUPPLIER shall determine the method, details and means of performing the work and services to be provided by SUPPLIER under this Agreement. SUPPLIER shall be responsible to City only for the requirements and results specified in this Agreement and, except as expressly provided in this Agreement, shall not be subjected to City's control with respect to the physical action or activities of SUPPLIER in fulfillment of this Agreement. If in the performance of this Agreement any third persons are employed by SUPPLIER, such persons shall be entirely and exclusively under the direction and supervision and control of the SUPPLIER.

6. Indemnification and Insurance:

a. SUPPLIER shall indemnify and save and hold harmless CITY from and for any and all losses, claims, actions, judgments for damages, or injury

to persons or property and losses and expenses and other costs including litigation costs and attorney's fees, arising out of, resulting from, or in connection with the performance of this Agreement by the SUPPLIER, its servants, agents, officers, employees, guests, and business invitees, and not caused by or arising out of the tortuous conduct of CITY or its employees. SUPPLIER shall maintain, and specifically agrees that it will maintain, throughout the term of this Agreement, liability insurance, in which the CITY shall be named an additional insured in the minimum amounts as follow: General Liability One Million Dollars (\$1,000,000) per incident or occurrence, Professional Liability One Million Dollars (\$1,000,000) per incident or occurrence, Automobile Liability Insurance One Million Dollars (\$1,000,000) per incident or occurrence and Workers' Compensation Insurance, in the statutory limits as required by law.. The limits of insurance shall not be deemed a limitation of the covenants to indemnify and save and hold harmless CITY; and if CITY becomes liable for an amount in excess of the insurance limits, herein provided, SUPPLIER covenants and agrees to indemnify and save and hold harmless CITY from and for all such losses, claims, actions, or judgments for damages or injury to persons or property and other costs, including litigation costs and attorneys' fees, arising out of, resulting from , or in connection with the performance of this Agreement by the SUPPLIER or SUPPLIER's officers, employs, agents, representatives or sub-SUPPLIERS and resulting in or attributable to personal injury, death, or damage or destruction to tangible or intangible property, including use of. SUPPLIER shall provide CITY with a Certificate of Insurance, or other proof of insurance evidencing SUPPLIER'S compliance with the requirements of this paragraph and file such proof of insurance with the CITY at least ten (10) days prior to the date SUPPLIER begins performance of it's obligations under this Agreement. In the event the insurance minimums are changed, SUPPLIER shall immediately submit proof of compliance with the changed limits. Evidence of all insurance shall be submitted to the City Purchasing Agent with a copy to Meridian City Accounting, 33 East Broadway Avenue, Meridian, Idaho 83642.

6.2 Any deductibles, self-insured retention, or named insureds must be declared in writing and approved by the City. At the option of the City, either: the insurer shall reduce or eliminate such deductibles, self-insured retentions or named insureds; or the SUPPLIER shall provide a bond, cash or letter of credit guaranteeing payment of losses and related investigations, claim administration and defense expenses.

6.3 To the extent of the indemnity in this contract, SUPPLIER's Insurance coverage shall be primary insurance regarding the City's elected officers, officials, employees and volunteers. Any insurance or self-insurance maintained by the City or the City's elected officers, officials, employees and volunteers shall be excess of the SUPPLIER's insurance

and shall not contribute with SUPPLIER's insurance except as to the extent of City's negligence.

b. The SUPPLIER's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

6.4 All insurance coverages for Suppliers subs shall be subject to all of the insurance and indemnity requirements stated herein.

6.5 The limits of insurance described herein shall not limit the liability of the Supplier and Supplier's agents, representatives, employees or subcontractors.

6.6 The limits of insurance described herein shall not limit the liability of the Contractor and Contractor's agents, representatives, employees or subcontractors.

7. **Bonds:** Payment and Performance Bonds are required.
8. **Warranty:** In addition to any warranty required in the specifications, all equipment, coatings, valves, controls, and other components provided under this agreement shall be guaranteed for two (2) years against defects in workmanship and materials from the notice of acceptance.
9. **Notices:** Any and all notices required to be given by either of the parties hereto, unless otherwise stated in this agreement, shall be in writing and be deemed communicated when mailed in the United States mail, certified, return receipt requested, addressed as follows:

City of Meridian
Procurement Manager
33 E. Broadway Avenue
Meridian, Idaho 83642
Ph. (208) 489-0417
Email: kwatts@meridiancity.org

KURITA AMERICA
Attn: ~~Steve Mayo~~ Alan Schneider
6600 94th Ave N
Minneapolis, Minnesota
55445
Ph.: ~~651-470-4290~~ 612-708-6517
e-mail: s.mayo@kurita-water.com

Either party may change their address for the purpose of this paragraph by giving written notice of such change to the other in the manner herein provided.

9. **Attorney Fees:** Should any litigation be commenced between the parties hereto concerning this Agreement, the prevailing party shall be entitled, in addition to any other relief as may be granted, to court costs and reasonable attorneys' fees as determined by a Court of competent jurisdiction. This provision shall be deemed to be a separate contract between the parties and shall survive any default, termination or forfeiture of this Agreement.
10. **Time is of the Essence:** The parties hereto acknowledge and agree that time is strictly of the essence with respect to each and every term, condition and provision hereof, and that the failure to timely perform any of the obligations hereunder shall constitute a breach of, and a default under, this Agreement by the party so failing to perform.
11. **Assignment:** It is expressly agreed and understood by the parties hereto, that SUPPLIER shall not have the right to assign, transfer, hypothecate or sell any of its rights under this Agreement except upon the prior express written consent of CITY.
12. **Discrimination Prohibited:** In performing the Work required herein, SUPPLIER shall not unlawfully discriminate in violation of any federal, state or local law, rule or regulation against any person on the basis of race, color, religion, sex, national origin or ancestry, age or disability.
13. **Reports and Information:**
 - 13.1 At such times and in such forms as the CITY may require, there shall be furnished to the CITY such statements, records, reports, data and information as the CITY may request pertaining to matters covered by this Agreement.
 - 13.2 SUPPLIER shall maintain all writings, documents and records prepared or compiled in connection with the performance of this Agreement for a minimum of four (4) years from the termination or completion of this or Agreement. This includes any handwriting, typewriting, printing, photo static, photographic and every other means of recording upon any tangible thing, any form of communication or representation including letters, words, pictures, sounds or symbols or any combination thereof.
14. **Audits and Inspections:** At any time during normal business hours and as often as the CITY may deem necessary, there shall be made available to the CITY for examination all of SUPPLIER'S records with respect to all

matters covered by this Agreement. SUPPLIER shall permit the CITY to audit, examine, and make excerpts or transcripts from such records, and to make audits of all contracts, invoices, materials, payrolls, records of personnel, conditions of employment and other data relating to all matters covered by this Agreement.

15. **Publication, Reproduction and Use of Material:** No material produced in whole or in part under this Agreement shall be subject to copyright in the United States or in any other country. The CITY shall have unrestricted authority to publish, disclose and otherwise use, in whole or in part, any reports, data or other materials prepared under this Agreement.
16. **Compliance with Laws:** In performing the scope of work required hereunder, SUPPLIER shall comply with all applicable laws, ordinances, and codes of Federal, State, and local governments.
17. **Changes:** The CITY may, from time to time, request changes in the Scope of Work to be performed hereunder. Such changes, including any increase or decrease in the amount of SUPPLIER'S compensation, which are mutually agreed upon by and between the CITY and SUPPLIER, shall be incorporated in written amendments which shall be executed with the same formalities as this Agreement.
18. **Construction and Severability:** If any part of this Agreement is held to be invalid or unenforceable, such holding will not affect the validity or enforceability of any other part of this Agreement so long as the remainder of the Agreement is reasonably capable of completion.
19. **Waiver of Default:** Waiver of default by either party to this Agreement shall not be deemed to be waiver of any subsequent default. Waiver or breach of any provision of this Agreement shall not be deemed to be a waiver of any other or subsequent breach, and shall not be construed to be a modification of the terms of this Agreement unless this Agreement is modified as provided above.
20. **Advice of Attorney:** Each party warrants and represents that in executing this Agreement. It has received independent legal advice from its attorney's or the opportunity to seek such advice.
21. **Entire Agreement:** This Agreement contains the entire agreement of the parties and supersedes any and all other agreements or understandings, oral or written, whether previous to the execution hereof or contemporaneous herewith.

22. **Order of Precedence:** The order or precedence shall be the contract agreement, the Invitation for Bid document, then the winning bidders submitted bid document.
23. **Applicable Law:** This Agreement shall be governed by and construed and enforced in accordance with the laws of the State of Idaho, and the ordinances of the City of Meridian.
24. **Approval Required:** This Agreement shall not become effective or binding until approved by the City of Meridian.

CITY OF MERIDIAN

BY: _____
Keith Watts, Procurement Manager

Dated: _____

KURITA AMERICA

BY: _____
Mary Sitko
SVP, Industrial & Municipal Capital Projects

Dated: 9/30/24

Approved by City Council: _____

Approved as to Form
CITY ATTORNEY

ATTACHMENT A SCOPE OF WORK

REFER TO REQUEST FOR PROPOSALS PW-2425-11083.d. ALL ADDENDUMS, ATTACHMENTS, AND EXHIBITS included in the Request for Proposals Package and written proposal by SUPPLIER dated AUGUST 8, 2024 are by this reference made a part hereof.

- Specifications titled - Well 24 Water Treatment Project dated June 2024 by JUB Engineers.

CITY OF MERIDIAN

MERIDIAN, IDAHO

SPECIFICATIONS

for the Equipment Procurement in support of

WELL 24 WATER TREATMENT PROJECT

JUNE 2024

ENGINEER:

J-U-B ENGINEERS, Inc.
2760 W. Excursion, Suite 400
Meridian, ID 83642
Telephone: (208) 376-7330

OWNER:

CITY OF MERIDIAN, ID
33 E. Broadway Ave.
Meridian, ID 83642

This page intentionally blank.

**SPECIFICATIONS
FOR
CITY OF MERIDIAN, IDAHO**

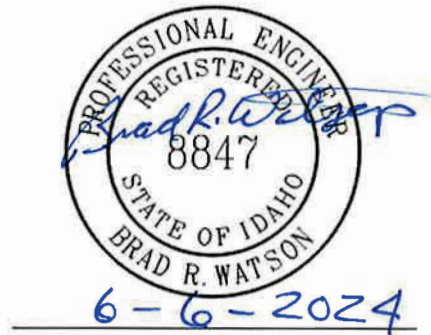
WELL 24 WATER TREATMENT FACILITY – FILTER EQUIPMENT PROCUREMENT

(Owner Project 11083.c)

JUNE 2024

J-U-B ENGINEERS, Inc.

(J-U-B Project No.: 10-23-091)



Original on file at 2760 W. Excursion, Suite 400, Meridian, ID 83642

NOTICE AND DISCLAIMER

THE PLANS AND/OR SPECIFICATIONS (DOCUMENTS) ARE THE PROPERTY OF J-U-B ENGINEERS, INC. ("J-U-B") AND BY USING THE DOCUMENTS YOU AGREE TO BE BOUND BY THE TERMS AND CONDITIONS IN THIS NOTICE AND DISCLAIMER.

THE USE OF THE DOCUMENTS CREATES NO DUTY IN CONTRACT, TORT, EQUITY OR OTHERWISE OF J-U-B TO THE USER. THE USER SHALL NOT (I) DISSEMINATE THE DOCUMENTS, OR ANY PART THEREOF, TO OTHERS WITHOUT THE WRITTEN CONSENT OF J-U-B, OR (II) USE THE DOCUMENTS, OR ANY PART THEREOF, FOR ANY USE OTHER THAN AS DESIGNATED HEREIN FOR THE INTENDED PROJECT. THE DOCUMENTS ARE NOT INTENDED FOR USE IN CREATING DTM FOR GRADING OR EARTHWORK, SURVEY STAKING LAYOUT (UNLESS SPECIFICALLY IDENTIFIED AS SUCH IN THE DOCUMENTS), OR PROPERTY BOUNDARY LAYOUTS.

J-U-B AND ITS AGENTS SHALL NOT BE LIABLE FOR ANY DAMAGES OR CLAIMS ARISING OUT OF THE UNAUTHORIZED USE OR MISUSE OF THE DOCUMENTS, OR ANY PART THEREOF, WHETHER SUCH DAMAGE OR CLAIM IS BASED IN CONTRACT, TORT OR OTHERWISE. THE USER HEREBY RELEASES AND SHALL DEFEND, INDEMNIFY AND HOLD J-U-B AND ITS AGENTS HARMLESS FROM ANY DAMAGES OR CLAIMS ARISING OUT OF, OR RELATED IN ANY WAY TO, THE USER'S UNAUTHORIZED USE OR MISUSE OF THE DOCUMENTS, OR ANY PART THEREOF.

IF THE DOCUMENTS ARE PROVIDED IN ELECTRONIC FORMAT, THE ELECTRONIC DOCUMENTS ARE SUBJECT TO THE PROVISIONS OF J-U-B's "ELECTRONIC DOCUMENT/DATA LIMITED LICENSE" FOUND AT edocs.jub.com

This page intentionally blank.

SPECIFICATIONS

TABLE OF CONTENTS

DIVISION 1 – GENERAL REQUIREMENTS

Section 01010 – Summary of Work

Section 01025 – Measurement and Payment

Section 01028 – Change Order Procedures

Section 01030 – Alternates

Section 01090 – Reference Standards

Section 01300 – Submittals

Section 01400 – Quality Control

Section 01410 – Supplier's Services

Section 01600 – Material and Equipment

Section 01700 – Contract Closeout

Section 01730 – Operations and Maintenance Information

DIVISION 11 – EQUIPMENT

Section 11100 – Iron and Manganese Removal Filter System

APPENDIX A – WELL 24 PILOT TEST REPORT

APPENDIX B - CITY OF MERIDIAN DESIGN CHECKLIST

This page intentionally blank.

SECTION 01010
SUMMARY OF WORK

PART 1 GENERAL

1.1 DEFINITIONS

- A. OWNER: City of Meridian, ID.
- B. SUPPLIER: entity, organization, or company selected to furnish iron and manganese removal water filtration equipment.
- C. CONTRACTOR: contractor installing the equipment under a separate contract.
- D. ENGINEER: J-U-B ENGINEERS, Inc.

1.2 GENERAL DESCRIPTION OF WORK

- A. One entity, organization, or company, denoted as the SUPPLIER in the Specifications herein, shall be selected to furnish water filtration equipment and materials required for the Meridian Well 24 Iron and Manganese Removal Project.
- B. Well 24 operates with a variable frequency drive. The design of the filter system will allow operation at full flow conditions without exceeding the maximum forward loading rates listed in Specification Section 11100. Bypass piping and control valve will be provided by the CONTRACTOR.
- C. The City of Meridian, ID, denoted as the OWNER in the Specifications herein, will award this contract to one SUPPLIER based on selection criteria outlined in the Request For Proposals.
- D. The CONTRACTOR will be awarded the overall construction contract by the OWNER at a later date and following this SUPPLIER selection.
- E. The overall project (by SUPPLIER and CONTRACTOR) will include providing and installing a new iron and manganese removal filter system at the OWNER's existing Well 24 facility, which is a groundwater well for potable supply. The filter system equipment will be housed inside of a new separate building. The well water will be oxidized with sodium hypochlorite before the filter system and wasted backwash water will be discharged to the OWNER's sanitary sewer system.

1.3 LOCATION

- A. Address: 2860 N. Blue Springs Ave., Meridian, ID 83646
- B. Latitude/Longitude: 43° 37'50.7" N, 116° 24' 50.7" W
- C. Approximate Ground Elevation: 2568 feet MSL

1.4 WORK INCLUDED IN THIS CONTRACT

- A. The SUPPLIER shall provide the OWNER with a complete iron and manganese removal filtration system in accordance with the Contract Documents. This Work includes the following SUPPLIER responsibilities:
 - 1. Providing complete assemblies and equipment in accordance with the Specifications herein, including the cost of shipping to the project site.
 - 2. Provide all equipment and materials required for a properly functional filtration system which meets the performance and prescriptive requirements set forth in Section 11100, Iron and Manganese Removal Filter System.
- B. The SUPPLIER shall also provide the following services to the OWNER and /or CONTRACTOR:
 - 1. Detailed design drawings of the filtration system following SUPPLIER selection and contract award.
 - 2. Operation and maintenance manuals and technical information for any equipment and materials provided as part of this Work. Technical information will be requested by the OWNER on an as-needed basis and may include equipment specifications, material composition, backwash flowrate estimates, power demand estimates, etc. See Section 01730, Operations and Maintenance Information.
 - 3. Installation support during construction of the overall facility and installation of the equipment, startup services for the equipment and materials provided as part of the Work, including coordination with the CONTRACTOR during installation, testing and commissioning, and onsite training of City staff for the operation and maintenance of the filtration system. See Section 01410, Manufacturer's Services.
- C. The SUPPLIER shall perform this Work within the following schedule:
 - 1. Refer to Part II of the contract for overall project schedule.
 - 2. Refer to Section 01300 for submittal requirements.

1.5 WORK NOT INCLUDED IN THIS CONTRACT

- A. The SUPPLIER shall not be responsible for the following Work, which is to be provided by the CONTRACTOR later and under a separate contract with the OWNER:
 - 1. The offloading and storage of equipment and materials at the Site, upon inspection and acceptance by the OWNER.

2. Installation of all equipment and materials specified herein.

PART 2 PRODUCTS

Not Used

PART 3 PART 3 EXECUTION

Not Used

END OF SECTION

This page intentionally blank.

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 RELATED SECTIONS

- A. Section 01300 – Submittals
- B. Section 01420 – Supplier's Services
- C. Section 11100 – Iron and Manganese Removal Filter System

1.2 GENERAL DESCRIPTION OF MEASUREMENT AND PAYMENT

- A. Measurement and Payment for this Work shall be based on the following milestones and corresponding payments (Refer to contract for % of total bid):
 - 1. The SUPPLIER shall receive 20% of total contract amount upon submittal of and OWNER approval of the following:
 - a) Final shop drawings and calculations.
 - b) All product information.
 - c) Performance guarantee.
 - 2. The SUPPLIER shall receive 60% of total contract amount upon submittal of and OWNER approval of the following submittals and completion of the following services:
 - a) Delivery, inspection, and OWNER acceptance of all equipment and materials supplied under this Work.
 - b) Final versions of all other submittals specified herein.
 - 3. The SUPPLIER shall receive 10% of total contract amount upon submittal of and OWNER approval of the following submittals and completion of the following services:
 - a) Installation inspection and final Certificate of Proper Installation.
 - b) Start-up services.
 - c) Field training of OWNER staff.
 - 4. The SUPPLIER shall receive the remaining 10% of total contract amount upon submittal of and OWNER approval of the following submittals and completion of the following services:
 - a) Advisement services during 60-day OWNER-operated trial period.

- b) All other services specified herein.
- c) Close-out of this Work in accordance with Section 01700.

- 5. OWNER payments to SUPPLIER will be in accordance with terms and conditions on Contract Documents.

PART 2 PRODUCTS

Not Used

PART 3 PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01028

CHANGE ORDER PROCEDURES

PART 1 GENERAL

1.1 RELATED SECTIONS

- A. Section 01025 – Measurement and Payment.
- B. Section 01300 – Submittals.
- C. Section 01700 – Contract Closeout.

1.2 SUBMITTALS

- A. Submit name of the individual authorized to receive change documents and be responsible for informing others in SUPPLIER's employ or Subcontractors of changes to the Work.
- B. Change Order Forms: use Change Order Form provided with contract, if provided.

1.3 DOCUMENTATION OF CHANGE IN CONTRACT PRICE AND CONTRACT TIME

- A. Maintain detailed records of work done on a time and material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Work.
- B. Document each quotation for a change in cost or time with sufficient data to allow evaluation of the quotation.
- C. On request, provide additional data to support computations:
 - 1. Quantities of products, labor, and equipment.
 - 2. Taxes, insurance and bonds.
 - 3. Overhead and profit.
 - 4. Justification for any change in Contract Time.
 - 5. Credit for deletions from Contract, similarly documented.
- D. Support each claim for additional costs, and for work done on a time and material basis, with additional information:
 - 1. Origin and date of claim.
 - 2. Dates and times work was performed, and by whom.
 - 3. Time records and wage rates paid.
 - 4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

1.4 CHANGE PROCEDURES

- A. The ENGINEER will advise of minor changes in the Work not involving an adjustment to Contract Price or Contract Time by issuing a field order.
- B. The ENGINEER may issue a Notice of Change which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. SUPPLIER will prepare and submit an estimate within five (5) days.
- C. The SUPPLIER may propose a change by submitting a request for change to the ENGINEER, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Price and Contract Time with full documentation and a statement describing the effect on Work by separate or other suppliers. Document any requested substitutions in accordance with Section 01300.

1.5 CONSTRUCTION CHANGE AUTHORIZATION

- A. ENGINEER may issue a Work Change Directive or other authorization, signed by the OWNER instructing the SUPPLIER to proceed with a change in the Work, for subsequent inclusion in a Change Order.
- B. The document will describe changes in the Work and will designate method of determining any change in Contract Price or Contract Time.
- C. Promptly execute the change in Work.

1.6 STIPULATED PRICE CHANGE ORDER

- A. Based on Notice of Change and SUPPLIER's fixed price quotation or SUPPLIER's request for a Change Order as approved by OWNER.

1.7 UNIT PRICE CHANGE ORDER

- A. For pre-determined unit prices and estimated quantities, the Change Order will be executed on a fixed unit price basis.
- B. For unit costs or quantities of units of work, which are not pre-determined, execute Work under a Change Order.
- C. Changes in Contract Price or Contract Time will be computed as specified for Time and Material Change Order.

1.8 TIME AND MATERIAL CHANGE ORDER

- A. Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- B. ENGINEER will recommend to the OWNER the change allowable in

Contract Price and Contract Time as provided in the Contract Documents.

- C. Maintain detailed records of work done on Time and Material basis.
- D. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

1.9 EXECUTION OF CHANGE ORDERS

- A. Execution of Change Orders: OWNER will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

1.10 CORRELATION OF SUPPLIER SUBMITTALS

- A. Promptly revise Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Price.
- B. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust time for other items of work affected by the change and resubmit.
- C. Promptly enter changes in Project Record Documents.

PART 2 PRODUCTS

Not Used

PART 3 PART 3 EXECUTION

Not Used

END OF SECTION

This page intentionally blank.

SECTION 01030

ALTERNATES

PART 1 GENERAL

1.1 RELATED SECTIONS

- A. Section 01300 – Submittals.

1.2 SUBMISSION REQUIREMENTS

- A. Submit alternates to ENGINEER with full description of the proposed Alternate and the effect on adjacent or related components including justification as an “or equal” item and documentation that it meets all specification and performance requirements.
- B. Document all effects on project cost and project schedule associated with acceptance of submitted alternate.
- C. Submit in accordance with Section 01300 - Submittals.

PART 2 PRODUCTS

Not Used

PART 3 PART 3 EXECUTION

Not Used

END OF SECTION

This page intentionally blank.

SECTION 01090

REFERENCE STANDARDS

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- A. Work under this project shall comply with the following Contract Documents listed below from highest precedence to lowest (in case of conflict, the higher precedence document will control):
1. These Technical Specifications.
 2. City of Meridian Electrical Standards, Specifications and Drawings, February 2023 (provided upon request).
 3. 2024 City of Meridian Public Works Water Facilities Design Checklist (Appendix B).
 4. 2023 City of Meridian Design Standards.
(<https://meridiancity.org/media/jkolbdtr/2023-design-standards-draft-changes-for-review-and-comment.pdf>)
 5. 2023 Edition of the City of Meridian Supplemental Specifications and Drawings to the ISPWC, and subsequent amendments thereto
(<https://meridiancity.org/community-development/land/standards-specifications-and-drawings/>)
 6. American Society of Mechanical Engineers (ASME): Section VIII, Division 1, Boiler and Pressure Vessel Code.
 7. American Society of Civil Engineers (ASCE): Manual 7-16, Minimum Design Loads and Associated Criteria for Building and Other Structures.
 8. American Water Works Association (AWWA).
 - a. B100: Granular Filter Material
 - b. C110: Ductile Iron and Gray Iron Fittings
 - c. C115: Flanged Ductile Iron Pipe with Ductile Iron or Gray Iron Threaded Flanges
 - d. D102: Coating Steel Water-Storage Tanks
 9. American Welding Society (AWS): D1.1, Structural Welding Code – Steel.
 10. The Society for Protective Coatings (SSPC):
 - a. Surface Preparation Specification No. 6: Commercial Blast Cleaning
 - b. Surface Preparation Specification No. 10: Near White Blast Cleaning

11. State of Idaho Department of Environmental Quality (IDEQ): IDAPA 58, Title 1, Chapter 8: Rules of Public Drinking Water Systems.
12. National Electrical Code (NEC).
13. National Electrical Manufacturer's Association (NEMA).
14. National Fire Protection Association (NFPA).
15. Underwriters Laboratories (UL).

1.2 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standard, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by the most recent date of issue.
- C. Maintain copy at jobsite during submittals, planning, and progress of the specific work, until Substantial Completion.
- D. Should specified reference standards conflict with Contract Documents, request clarification from ENGINEER before proceeding.
- E. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 RELATED SECTIONS

- A. Section 01400 – Quality Control.
- B. Section 11100 – Iron and Manganese Removal Filter System

1.2 SUBMITTAL PROCEDURES

- A. Deliver submittals to the OWNER and to the ENGINEER via email or other mutually agreed upon electronic platform.
- B. Provide submittals required in each technical specification or as called for elsewhere in the Contract Documents.
- C. Transmit each submittal in the format described in the Contract Documents. Submittals not in accepted format will be returned for correction without ENGINEER's review.
- D. Identify Project, SUPPLIER, Subcontractor or supplier; pertinent Drawing sheet and detail name or number(s), and specification Section number, as appropriate.
- E. Apply SUPPLIER's stamp, signed or initialed, certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- F. Schedule submittals to expedite the Project and deliver to OWNER. Coordinate submission of related items.
- G. Identify variations from Contract Documents and Product or system limitations.
- H. Revise and resubmit submittals as required, identifying all changes made since previous submittal.

1.3 CONTRACT PROGRESS SCHEDULES

- A. Incorporate the work described herein into contract progress schedules and submit and update schedules per the Contract Documents.
- B. Submit revised schedules with each Application for Payment identifying changes since previous version.

1.4 PROPOSED PRODUCTS LIST

- A. For products specified only by reference, give manufacturer, trade name, model or catalog designation, and reference standards.

1.5 SHOP DRAWINGS

- A. Within thirty (30) days after date of execution of the OWNER-SUPPLIER agreement, SUPPLIER shall submit submittals and preliminary shop drawings including tank layout, dimensions, anchoring details, and supplied valving.
- B. Within fourteen (14) days after ENGINEER's return of each reviewed submittal, submit revised final submittals..

1.6 PRODUCT DATA

- A. Mark each submittal to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- B. Indicate product utility characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

1.7 MANUFACTURERS' INSTRUCTIONS

- A. Submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- C. Identify conflicts between manufacturers' instructions and Contract Documents.

1.8 MANUFACTURERS' CERTIFICATES

- A. When specified in individual specification Sections, submit manufacturer's certificate to ENGINEER for review.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product but must be acceptable to ENGINEER.

1.9 QUALITY CONTROL SUBMITTALS

- A. When specified in individual specification Sections, submit quality control submittals to ENGINEER for review and approval.

- B. Functional and performance testing submittals shall include all collected data.

1.10 OPERATION AND MAINTENANCE SUBMITTALS

- A. Transmit draft operation and maintenance information in accordance with Submittal Procedures specified in this Section.
- B. Submit in accordance with Section 01730.

1.11 CONSTRUCTION PHOTOGRAPHS

- A. None required.

1.12 RECORD DRAWINGS

- A. Submit record drawings of equipment as delivered.

1.13 SUBMITTAL LIMITS

- A. Two submittals will be permitted for each item in this section at no cost to the SUPPLIER. The two submittals include one initial submittal and one resubmittal.
- B. All submittals requiring a third review by the ENGINEER shall be considered unresponsive and the OWNER will charge the SUPPLIER on a Time and Materials basis for the third and all subsequent reviews and all related administrative costs not to exceed \$1,000.00 for each resubmittal.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

This page intentionally blank.

SECTION 01400
QUALITY CONTROL

PART 1 GENERAL

1.1 RELATED SECTIONS

- A. Section 01090 – Reference Standards.
- B. Section 01300 – Submittals.
- C. Section 11100 – Iron and Manganese Removal Filter System.

1.2 DEFINITIONS

- A. SUPPLIER's Representative: an individual qualified to represent the SUPPLIER in the field. Specific tasks within this Specification require the representative to be qualified to inspect equipment installation, train OWNER on equipment operation, or test equipment performance.

1.3 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Experience

1. SUPPLIER:

- a) Regularly engaged in the design and manufacture of the filter system equipment and shall have manufactured the specified filter assemblies for at least five years.
- b) Provide a list of at least five similar iron and manganese removal facilities, including name and contact information, that have been successfully meeting manganese removal goals over the last five years.

2. SUPPLIER's Representative:

- a) Has overseen the installation and start-up of not less than five filter systems of similar type and size as this Work.
- b) The representative must be qualified to represent all equipment and materials provided by SUPPLIER, or SUPPLIER shall provide Manufacturer representatives for specific specialized equipment.

- B. Provide detailed and timely installation instructions to CONTRACTOR, including each step in sequence.

1.4 REFERENCES

- A. Conform to referenced standards current on date of Request for Qualifications.
- B. If specified reference standards conflict with Contract Documents, request clarification from ENGINEER before proceeding.
- C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents except as expressly described in the Request for Qualifications and Agreement executed by the OWNER and the Supplier.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01410

SUPPLIER'S SERVICES

PART 1 GENERAL

1.1 RELATED SECTIONS

- A. Section 01090 – Reference Standards.
- B. Section 01300 – Submittals.
- C. Section 11100 – Iron and Manganese Removal Filter System.

1.2 DEFINITIONS

- A. SUPPLIER's Representative: an individual qualified to represent the SUPPLIER in the field. Specific tasks within this Specification require the representative to be qualified to inspect equipment installation, train OWNER on equipment operation, and test equipment performance.

1.3 SUPPLIER'S FIELD SERVICES

A. General

- 1. Furnish manufacturer's representative(s) for installation inspection, starting of systems, performance testing, demonstration and instructions and trial facility support for the minimum number of days listed below (travel time excluded):
 - a) Installation inspection: three (3) days;
 - b) Starting of systems: two (2) days;
 - c) Performance testing: two (2) days
 - d) Demonstration and instructions: two (2) days;
 - e) Trial facility support: 60 days (available for advisement to the OWNER).

B. Installation Inspection

- 1. SUPPLIER's representative shall inspect installation of all provided equipment and materials and provide technical information regarding installation and start-up. Multiple site visits may be necessary and be coordinated with CONTRACTOR. The SUPPLIER's representative shall only advise the CONTRACTOR and OWNER and shall not supervise or direct CONTRACTOR work. The qualified representative will observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance of equipment as applicable, and to initiate instructions when necessary. SUPPLIER's representative shall respond to CONTRACTOR inspection requests

within three (3) days and provide schedule of inspection availability.

2. SUPPLIER's representative will report, in writing, observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
3. Transmit report in accordance with Section 01300 within fifteen (15) days of observation to ENGINEER for review.

C. Starting Systems

1. Notify ENGINEER and OWNER seven (7) days prior to start-up of each system.
2. SUPPLIER's representative shall be present for equipment startup and will provide manufacturer's startup instructions to CONTRACTOR prior to startup. The representative will advise the CONTRACTOR during equipment startup.
3. Coordinate schedule for start-up of various equipment and systems with CONTRACTOR.
4. Verify that each piece of equipment or system has been checked for proper lubrication, control sequence, or other conditions which may cause damage.
5. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
6. Verify wiring and support components for equipment are complete and tested.
7. Execute start up under supervision of responsible manufacturer's representative in accordance with manufacturers' instructions.
8. When specified in individual specification sections, manufacturer will provide an authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start up, and to supervise placing equipment or putting system into operation.
9. Submit a written report in accordance with Section 01400 that equipment or system has been properly installed and is functioning correctly.

D. Performance Testing

1. Submit performance testing submittals in accordance with Section 01300 and Section 11100.
2. SUPPLIER's Representative shall provide approved testing plans to

CONTRACTOR prior to testing and shall be present during all performance testing. The representative will advise the CONTRACTOR during tests.

3. The SUPPLIER shall be responsible for all filter system performance testing submittals specified herein.

E. Demonstration and Instructions

1. After all components have been started, tested, adjusted and verified by the SUPPLIER's representative, demonstrate operation and maintenance of Products to OWNER's personnel two (2) weeks prior to date of Substantial Completion.
2. Training program shall include, but is not limited to a:
 - a) Detailed review of operation and maintenance manuals with OWNER's personnel, explaining all aspects of operation and maintenance.
 - b) Demonstration of start-up, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at scheduled times, at equipment location.
3. Supply operation and maintenance manuals in accordance with Section 01730.
4. Prepare and insert additional data in operations and maintenance manuals when needed or additional data becomes apparent during instruction.

F. Trial Facility Support

1. Upon completion of start-up services, filter and associated facilities will be brought on-line for a period of sixty (60) days. During this trial period, the SUPPLIER shall be available by phone or email to advise OWNER and CONTRACTOR on final adjustments to operation of the system to the satisfaction of the ENGINEER and OWNER. SUPPLIER shall respond to advisement requests within three (3) business days.
2. Completion of the Trial Facility Support does not negate or fulfill the obligations of the SUPPLIER's warranty.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01600
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products
- B. Transportation and handling
- C. Delivery Coordination
- D. Storage and protection

1.2 RELATED SECTIONS

- A. Section 01025 – Measurement and Payment
- B. Section 01300 – Submittals
- C. Section 01400 – Quality Control
- D. Section 11100 – Iron and Manganese Removal Filter Equipment

1.3 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Equipment. Does not include machinery and equipment used for preparation, fabrication, conveying or erection of the Equipment.
- B. Provide interchangeable components of the same manufacturer for similar components.

1.4 TRANSPORTATION AND HANDLING

- A. Prepare and transport products to project site in accordance with manufacturer's standard protocol. Prepare and package all equipment to prevent damage during transit.
- B. Coordinate equipment delivery with the OWNER and the CONTRACTOR. The CONTRACTOR will provide dates for earliest possible and latest possible delivery. Ship the equipment to project site between these dates. Provide five (5) business days notice to CONTRACTOR of actual planned delivery date. Arrange shipment of all equipment to be delivered to project site Monday through Friday (except holidays) between 8:00 AM and 5:00 PM, Mountain Time.

- C. CONTRACTOR will unload equipment at the project site. Provide detailed off-loading and storage instructions to CONTRACTOR. Once the CONTRACTOR has accepted delivery of the equipment, the CONTRACTOR assumes responsibility for storage and protection of the equipment.
- D. The OWNER will not provide temporary off-site storage of the Equipment.

1.5 DELAYED DELIVERY

- A. The OWNER reserves the right to delay delivery of the Equipment up to three (3) months from the original delivery date in order to align with projected construction schedule. No cost increase to the OWNER for such a delivery delay is allowed. If the OWNER issues a delay notice to the SUPPLIER, SUPPLIER will provide revised delivery date windows to the OWNER and the CONTRACTOR.
- B. If a delay notification is issued to the SUPPLIER, the SUPPLIER may proceed, at its sole discretion, with equipment fabrication in accordance with its original schedule and store the equipment at a secure site. Provide location and storage methodology to OWNER for approval a minimum of thirty (30) days in advance of placing Equipment in storage. The SUPPLIER assumes all liability for the Equipment until delivery to the project site and acceptance of Equipment by the OWNER. No advance payments will be made to the SUPPLIER in this circumstance.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 RELATED SECTIONS

- A. Section 01010 – Summary of Work.
- B. Section 01400 – Quality Control.

1.2 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been observed and documented, and that Work is complete in accordance with Contract Documents and ready for ENGINEER's review.
- B. Provide submittals to ENGINEER that are required by these specifications and applicable governing authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.3 OPERATION AND MAINTENANCE DATA

- A. Submit data in accordance with Section 01300 and Section 01730.

1.4 WARRANTIES

- A. Submit warranties in accordance with Section 01300 and Section 11100.
- B. All guarantee work shall be done promptly by the SUPPLIER upon submittal of proof of defect.
 - 1. Provide duplicate notarized copies.
 - 2. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
 - 3. Submit prior to final application for Payment.
 - 4. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

This page intentionally blank.

SECTION 01730

OPERATION AND MAINTENANCE INFORMATION

PART 1 GENERAL

1.1 SCOPE

- A. Operation and maintenance (O&M) instructions shall be provided in accordance with this section and as required in the technical sections of the Contract Documents. O&M information shall be provided for each piece of equipment, equipment assembly or subassembly, and material provided or modified under this Contract. O&M information must be delivered when the piece of equipment is delivered to the project site.
- B. O&M instructions must be submitted and accepted before on-site training and any equipment testing may start.
- C. SUPPLIER must comply with and is responsible for compliance with O & M procedures until final completion is reached.

1.2 TYPES OF INFORMATION REQUIRED

- A. GENERAL: O&M information shall contain the names, addresses, and telephone numbers of the manufacturer, the nearest representative of the manufacturer, and the nearest supplier of the manufacturer's equipment and parts. In addition, the following items of information shall be provided, as applicable.
- B. OPERATING INSTRUCTIONS: Specific instructions, procedures, and illustrations shall be provided for the following phases of operations:
 - 1. Safety Precautions: List personnel hazards for equipment and list safety precautions for all operating conditions.
 - 2. Operator Prestart: Provide requirements to set up and prepare each system for use.
 - 3. Startup, Shutdown, and Post Shutdown Procedures: Provide a control sequence for each of these operations.
 - 4. Normal Operations: Provide control diagrams with data to explain operation and control of systems and specific equipment.
 - 5. Emergency Operations: Provide emergency procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Include emergency shutdown instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance on emergency operations of all systems including valve locations and portions of systems

controlled.

6. Operator Service Requirements: Provide instructions for services to be performed by the operator such as lubrication, adjustments, and inspection.
7. Environmental Conditions: Provide a list of environmental conditions (temperature, humidity, and other relevant data) which are best suited for each product or piece of equipment and describe conditions under which equipment should not be allowed to run.

C. PREVENTIVE MAINTENANCE: The following information shall be provided for preventive and scheduled maintenance to minimize corrective maintenance and repair:

1. Lubrication Data: Provide the following lubrication data:
 - a) A table showing recommended lubricants for specific temperature ranges and applications;
 - b) Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities; and,
 - c) A lubrication schedule showing service interval frequency.
2. Preventive Maintenance Plan and Schedule: Provide manufacturer's schedule for routine preventive maintenance, inspections, tests, and adjustments required to ensure proper and economical operation and to minimize corrective maintenance and repair. Provide manufacturer's projection of preventative maintenance man-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft, as applicable.
3. System Shut-Down Maintenance Plan and Schedule: Provide manufacturer's schedule for maintenance, inspections, tests, and adjustments required to protect system from degradation during long periods of non-use.

D. CORRECTIVE MAINTENANCE: Manufacturer's recommendations shall be provided on procedures and instructions for correcting problems and making repairs.

1. Troubleshooting Guides and Diagnostic Techniques: Provide step-by-step procedures to promptly isolate the cause of typical malfunctions. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.
2. Wiring Diagrams and Control Diagrams: Wiring diagrams and control diagrams shall be point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete

and accurate depiction of the actual job-specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type with the actual installation numbering.

3. Maintenance and Repair Procedures: Provide instructions and list tools required to restore product or equipment to proper condition or operating standards.
4. Removal and Replacement Instructions: Provide step-by-step procedures and list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings, and adjustments required. Instructions shall include a combination of test and illustrations.
5. Spare Parts and Supply Lists: Provide lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonable delays. List spare parts and supplies that have a long lead time to obtain.
6. Corrective Maintenance Man-hours: Provide manufacturer's projection of corrective maintenance man-hours including craft requirements by type of craft. Corrective maintenance that requires participation of the equipment manufacturer shall be identified and tabulated separately.

E. APPENDICES: The following information shall be provided; include information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment.

1. Parts Identification: Provide identification and coverage for all parts of each component, assembly, subassembly and accessory items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number which will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by components, assemblies, and subassemblies. Provide list of recommended spare parts to be maintained by OWNER.
2. Warranty Information: List and explain the various warranties and include the servicing and technical precautions prescribed by the manufacturers or contract documents to keep warranties in force.
3. Personnel Training Requirements: Provide information available from the manufacturers to use in training designated personnel to

operate and maintain the equipment and systems properly.

4. Testing Equipment and Special Tool Information: Provide information on test equipment required to perform specified tests and special tools needed for the operation, maintenance, and repair of components.
5. Safety Information: Provide applicable safety data sheets (SDS) for all materials supplied.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 TRANSMITTAL PROCEDURE

- A. Unless otherwise specified, O&M manuals, information, and data shall be transmitted in accordance with Section 01300 accompanied by Transmittal Form. The transmittal form shall be used as a checklist to ensure the manual is complete. Only complete sets of O&M instructions will be reviewed for acceptance.
- B. Submit the final O&M information in accordance with Section 01300. One (1) electronic copy (portable document format, i.e. PDF with bookmarks) and two (2) hard copies shall be provided. For ease of identification, each manufacturer's brochure and manual shall be appropriately labeled with the equipment name and equipment number as it appears in the project manual. Each piece of equipment given an asset tag number by the OWNER must be labeled with that asset tag number(s). The manuals shall be indexed and reference the discrete equipment number on all manuals, data sheets and drawings. The binders shall be provided with a table of contents and tab sheets to permit easy location of desired information. Binders shall be three-post type, with durable covers with metal hinges and locking slide bar assembly and shall be capable of extending to a maximum 6-inch thickness.
- C. If manufacturer's standard brochures and manuals are used to describe O&M procedures, such brochures and manuals shall be modified to reflect only the model or series of equipment used on this project. Extraneous material shall be crossed out neatly or otherwise annotated or eliminated.
- D. Submit Operation and Maintenance Manuals printed on 8½ in. x 11 in. size heavy quality paper (20 lb. or heavier). Reduce drawings or diagrams bound in manual to 8½ in. x 11 in. or 11 in. x 17 in. size.
- E. Following the acceptable installation and operation of an equipment item, the item's instructions and procedures shall be modified and supplemented by the SUPPLIER to reflect any field changes or information requiring field data.

END OF SECTION

SECTION 11100

IRON AND MANGANESE REMOVAL FILTER SYSTEM

PART 1 GENERAL

1.1 RELATED SECTIONS

- A. Section 01300 – Submittals.
- B. Section 01400 – Quality Control.
- C. Section 01650 – Starting of Systems.
- D. Section 01730 – Operations and Maintenance Information.

1.2 PERFORMANCE GUARANTEE

- A. Review the filter influent raw water quantities and qualities and the specific requirements of this Work and guarantee in writing that the filter system will consistently produce a filter effluent which meets the design requirements included in this Section.
- B. The guarantee will be based on the OWNER properly operating and maintaining the filter system, as defined and detailed in the equipment O&M Manual provided by the SUPPLIER as part of this Work.

1.3 WARRANTY

- A. Warranty: Include two (2) year coverage on all supplied parts, workmanship, and materials. Warranty coverage will start on date of final acceptance.

1.4 SUBMITTALS

- A. SUPPLIER will submit all items in the table below under the provisions of Section 01300.

Table 1. Submittal Schedule		
Deliverable	Specification Reference	When to Submit
Shop Drawings and Calculations	1.5.B	Initial Submittal
Warranty	1.4.A	Initial Submittal
Product Data	1.5.B	Initial Submittal
Delivery and Storage Requirements	1.5.C.12	Initial Submittal
Operation and Maintenance Manuals	1.5.E.2	Prior to Shipment
Pressure Vessel Coating Inspection & Testing Report	2.11.C & D	Prior to Shipment
Bill of Materials	1.5.C.11	With Shipment
Functional Testing	1.5.D.4	Prior to Shipment
Sample of Media and Sieve Analysis	1.5.D.3	Prior to Shipment
Startup Procedures	1.2.B.3	2 Weeks Prior to Startup

Final PLC and HMI Applications and Passwords to OWNER		At Startup
---	--	------------

B. Shop Drawing Submittals:

1. Submit detailed shop drawings. Include one digital AutoCAD file of the final submittal that includes line work of the overall system plan view and each profile view included in the shop drawings.
2. Include dimensions, component details, materials, piping connections, control interface detail, and power connection detail for proper installation and operation of drawings.
3. Provide drawings of the entire filter system layout that includes the following information:
 - a) Proposed tank and ancillary equipment layout in plan and profile views.
 - b) Overall system dimensions, including horizontal and vertical area.
 - c) Dimensions between tank, equipment, piping, and other supplied objects.
 - d) Description and location of all pipe connections, power connections, and control interface requirements.
 - e) Description and illustration of proper access and clearance around all tanks and equipment for safe and easy operation and maintenance. Refer to clearance requirements in this Section.
4. Provide drawings with detailed schematic showing water flow path through the filter system for both the normal and backwash operational modes and any other modes proposed by SUPPLIER. Include in the schematic a detailed view of the water flow path through the filter vessel internal parts for each operational mode.
5. Provide hydraulic head loss calculations for the entire system and for each operational mode. Refer to Design Requirements in this Section for range of system pressure and flow rate.
6. Filter Tank:
 - a) Drawings must include plan, profile, and section views that show internal and external dimensions and locate all access hatches, pipe connections, and all other tank appurtenances.
 - b) Coating information, including a color chart. OWNER to choose exterior tank color.

7. Provide drawings that include the following power and control information and requirements:
- a) Detail of all mechanical and electrical process control systems being proposed with the filter system.
 - b) Process and Instrumentation Diagrams (P&ID) and written control narratives for all system functions to be controlled, monitored, or alarmed.
 - c) Schematic diagrams that include wiring diagrams of control panels, line numbers for associated device contacts shown in the schematic diagrams, and detail of the interface between field wiring and manufactured systems.
 - d) All control panels and power supply panels included with the filter system must be detailed with panel layouts, dimensions, materials list, connection requirements, and access requirements.
 - e) Input power requirements including voltage, frequency, phase requirement, total system maximum power load, and power quality limits.
 - f) HMI screens. Sample screen shots for the system. The screen shots must show the screens that will be available from the HMI.
 - g) A Ethernet/IP tag list with all tag information i.e., data type, read/write and description available for communication with the City's PLC and SCADA system shall be included. It is the Vendor's responsibility to notify the City and their integrator to any changes to the tag list after an approved submittal has been provided.
 - h) IP addressing for Vendor provided equipment that is capable of network communications i.e. VFD's, PLC's, Instruments, PC's, HMI's, etc. shall be included for coordination with the City's IP address requirements for the project site.
 - i) The existing Process Instrumentation and Control System (PICS) standard is Ethernet IP network protocol and is based on the City's standard Rockwell Automation platform. Network standardization is required to maximize operational efficiency and effectiveness and minimize network operational costs.
 - j) All new equipment connected to PICS via Ethernet shall utilize native Ethernet IP protocol. The term "native" used in this context means that the protocol is integral to the equipment—a converter or gateway to convert from one protocol to another (e.g., Modbus Plus to Ethernet IP) is not required. The use of protocol converters and gateways for substitute equipment is not

acceptable.

8. Structural Information:

- a) Provide vertical and lateral (seismic) design loads for foundation design requirements.
- b) Provide all structural calculations for the filter system equipment, tank, and tank anchorage. The design must meet the requirements of 2018 IBC (latest version), ASCE 7-16, and ACI 318-14 (including Appendix D) and signed by a Professional Engineer (P.E.) licensed in the State of Idaho.

C. Product Data Submittals:

- 1. Submit a complete list of major products proposed.
- 2. Submit product data for the filter system and all included equipment and materials.
- 3. Submit design data for the filter system and all included equipment and materials.
- 4. Submit detailed drawings for assembled filter system including:
 - a) Front, left, right, rear, plan, and underside views.
 - b) Isometric view.
 - c) Label all valves according to the OWNER's asset management system.
- 5. Submit design calculations, signed by an Idaho licensed P.E., and product data for tank anchor bolts including diameter, location, quantity, material, and type. Anchor bolt length will be determined by the OWNER's ENGINEER. Anchor bolts and epoxy, if necessary, will be supplied by the CONTRACTOR.
- 6. Submit factory inspection logs and performance testing logs for all equipment and materials supplied.
- 7. Submit manufacturer's installation instructions.
- 8. Submit manufacturer's certificate of proper installation, stating that all equipment and materials provided by the SUPPLIER were properly installed by the CONTRACTOR.
- 9. Submit details of the SUPPLIER recommended filter media(s) that meet the performance requirements included in this Section. This includes media type, size, layer depth, overall media depth, and layering order.

10. Submit details on the estimated backwash water quantity, quality, and loading rate per filter cell backwash. This includes details on any air injection or scour system included with the backwash system.
11. Provide a detailed list of all hardware, fasteners, or materials required to interface with the mechanical, structural, electrical, control and monitoring instrumentation, and any other system supplied as part of the filter system. This includes all required interfaces or connections, and SUPPLIER recommended size or type of connection.
12. Submit a final bill of materials with delivery with manufacturer name and contact information, product name, product model number, and quantity for all final equipment and materials installed.
13. Submit equipment and material delivery and storage requirements for all equipment and materials.

D. Quality Control Submittals:

1. Submit all quality control submittals under provisions of Section 01300 and Section 01400.
2. Submit a performance guarantee that the filter system components meet or exceed specified requirements, are properly sized and performance is guaranteed.
3. Submit a sample of the media material and the results of a sieve analysis on a representative sample prior to transport.
4. Functional Testing: Provide documentation that each filter system element requiring functional testing has been tested. Functional testing is not considered complete until the documentation is submitted and accepted by the ENGINEER.
5. Performance Testing Plan: Submit a performance testing plan that includes a narrative of the testing, data to be collected, analysis to be completed, and the detailed method of determining or defining filter system performance. Include the analysis of the quantity and quality of the raw water and filtered water from the performance test.
6. Performance Testing Report: Submit a report summarizing data collected and analysis done during the performance test and include a narrative of the results of the test. Include a determination and summary of the performance of the filter system throughout the test in the report. Performance testing will not be considered complete until the report is submitted to and approved by the ENGINEER.

E. General Submittals

1. Submit startup procedure information to the OWNER and General

CONTRACTOR. The startup procedure information must include all steps and materials needed to startup and prepare the filter system for normal operations, including any washing and conditioning of the media.

2. Submit an Operation and Maintenance Manual for the filter system in accordance with Section 01300 and Section 01730.

1.5 QUALITY ASSURANCE

- A. Refer to Section 01400 Quality Control.

PART 2 PRODUCTS

2.1 GENERAL

- A. All products in contact with potable water must be NSF 61 and NSF 600 certified and meet current lead requirements.
- B. All interior tank piping and components must be 304 stainless steel; including, but not limited to the backwash trough, underdrain, airwash header nozzles, and fasteners.
- C. Meet all requirements of the National Electrical Code (NEC), NEMA, NFPA, and all applicable local codes for electrical systems, assemblies, and distribution of.
- D. Comply with Idaho State Administrative Code 58.01.08, Idaho Rules for Public Drinking Water Systems for the filter system.

2.2 FILTER SYSTEM

- A. A pilot test was conducted on this well in 2021 and a Pilot Test Report is included in this Section as a Supplement. The Pilot Test Report is for reference only and not used as a substitution to these Specifications.
- B. Design the filter system based on the design requirements included in this Section.
- C. Scope of Supply: Supply all equipment and materials required for a properly functional water filtration system for the removal of manganese and iron. The filter system includes, at the minimum, the following components:
 1. Filter Tanks.
 2. Filter Media.
 3. Valves.
 4. Valve actuators.
 5. Backwash and treated effluent flow meters.

6. Face piping and interconnecting pipes.
7. Instrumentation and control systems.
8. Power supply system.
9. Pressure gauges and transmitters.
10. Blower.
11. Any additional equipment, materials, appurtenances, and accessories required for a complete and operational system.
12. The following components are to be supplied by OWNER or by General CONTRACTOR under a separate contract:
 - a) Well pump.
 - b) Backwash wastewater system from the SUPPLIERS face piping to the wastewater collection system.
 - c) Sodium hypochlorite storage.
 - d) Chemical dosing pump(s).
 - e) Chemical injection system (upstream of filter system).
 - f) Chlorine analyzer(s).
 - g) Power source.
 - h) Building.
 - i) Concrete equipment pads.

D. Space Requirements

1. The complete filter system supplied as part of this Work and safe clearances is limited to the following space requirements:
 - a) Maximum Filter System Horizontal Area (including piping and valves): 550 Square Feet
2. Minimum clearances:
 - a) Tank manway hatches, control panel doors, power cabinet doors, or any other door/hatches must open completely and have the following clearance from door/hatch in any normal position: 18 Inches
 - b) Pipe appurtenances (valves, flow meters, etc.)..... 24 Inches

c) Power energized, floor-mounted equipment 42 Inches

2.3 DESIGN REQUIREMENTS

- A. Design requirements for the manganese and iron removal filter system must be based on the following parameters and requirements in **Table 1**:

Table 1: Filtration System Design Criteria			
Parameter	Criteria	Units	Notes
Design Flow Rate	2,000	GPM	
Water Source			Groundwater
Operating Pressure Range	75 - 100	PSI	
Target Effluent Pressure Range	77 – 80	PSI	Post filter target
Test Pressure	150	PSI	Filter tank and associated appurtenances
Number of Pressure Vessels	1	Each	Horizontal, single vessel
Number of Cells	3	Cell	
Influent Iron Concentration	0.13	mg/L	
Effluent Iron concentration	0.10	mg/L	
Influent Manganese Concentration	0.10	mg/L	
Effluent Manganese Concentration	0.01	mg/L	
Influent Ammonia Concentration	0.03	mg/L	
Effluent Free Chlorine Concentration	1.0	mg/L	
Influent Typical pH	7.5		
Filtration Media	N/A		Pyrolusite
Maximum Forward Loading Rate	8	GPM/SF	
Filtration Media Depth	36	Inches	Supplier to provide final recommended depth.
Gravel Media Depth	15	Inches	Supplier to provide design including support media depth, depths and media type.
Backwash Process	Simultaneous Air/Water		Continuous filter operation during backwash required
Ground Elevation	2568	Ft MSL	

- B. The filtration system will be a single horizontal tank design with three (3) filter cells. The backwash system will backwash one (1) filter cell at a time and use treated source water provided by the other two cells.
- C. The filtration system will have the piping and controls to allow any number of cells to be in operation without exceeding the Maximum Forward Loading Rate specified in this Section and include the ability to reduce overall flow to the filtration system or allow a portion of total flow to bypass the filter system to prevent the exceedance.
- D. Well 24 operates with a variable frequency drive. The design of the filter system will operate at full flow conditions without exceeding the maximum

forward loading rates listed in Specification Section 11100, 2.3.A. Bypass piping and associated control valves will be provided by the installation contractor. The CONTRACTOR is the filter equipment installation contractor. The bid for the Installation CONTRACTOR will be done separately at the conclusion of the design of the system.

2.4 FILTER TANK

- A. The system will consist of horizontal filter only. The system will be designed for backwash of each filter cell once per day or less at design requirements listed in Part 2.9 of this Section.
- B. Design the filter tank to withstand an operating pressure of 100 psi and transient conditions up to 150 psi. Tank shall be pressure tested to 150 psi.
- C. Material: welded steel construction using SA-516 Grade 70 steel.
- D. Design and construction of the tank per ASME code requirements for pressure vessels, including ASME stamp. Pressure test to 150 psi per Part 2.3.B of this Section supersedes ASME code pertaining to test pressure.
- E. Minimum side wall height: ten (10) feet.
- F. Design each tank cell with an air release valve on top of the cell. See *Hatch Air Release Schematic* at the end of this section.
- G. Each tank is to include manway hatches, sufficient handholds, and hand holes for inspection and maintenance. Size manway hatches for safe human access to the inside of the vessel. Each filter cell must have at least one (1) manway hatch near the top of the vessel for inspection and media loading (24-inch minimum opening, hinged and pressure-tight), one (1) manway near the bottom of sidewall for underdrain inspection and media removal (bolted flange style), and one (1) hand hole at the of the top vessel. Manufacture hatches with hinges to facilitate opening/closing operation.
- H. Provide a ½-inch NPT threaded piping connection at the top of each 24-inch manway hatch to allow for air release pipe installation in the field by the CONTRACTOR. See schematic detail at the end of this section. See *Hatch Air Release Schematic* at the end of this section.
- I. Include structural components required for proper installation and anchorage (e.g., lifting lugs, support legs, etc.). Support legs to be at a height such that bottom of leg is a minimum of 30" below bottom of tank.

2.5 FILTER TANK INTERNAL DISTRIBUTION

- A. Furnish filter with an inlet distributor/backwash collector designed for uniform distribution of inlet water over the entire filter bed and for the uniform collection of the backwash water during the backwash operation. The top of the backwash collector must be at least eighteen (18) inches above the surface of the filter media.

- B. Furnish each filter cell with a backwash distribution system designed for uniform distribution of backwash water throughout the filter bed media during backwash operation.

2.6 UNDERDRAIN SYSTEM

- A. Filter vessels shall be provided with a curved plate underdrain, as follows. Design the underdrain system to be accessible for inspection and maintenance.
 - 1. Curved Plate Underdrains: Each filter bottom shall be equipped with a curved plate underdrain system consisting of a steel plate of proper radius extending over full length of the filter. The underdrain plate on which the support gravel rests shall be welded to the filter tank shell and head and shall be sufficiently strong to carry the filter media plus the maximum possible hydraulic pressure that can be applied. It shall be perforated with openings to receive non-clogging distributors. The underdrain shall be designed to reduce the water velocity, discharging the water horizontally without impeding its flow, thereby preventing channeling in the filter bed. A 14" x 18" manway shall be provided for access beneath the underdrain for each isolated cell for inspection and maintenance purposes.

2.7 AIR SCOUR GRIDS

- A. Furnish an in-bed air scour distributor system for each filter cell to be placed at the interface between the supporting gravel bed and the filter media. The air wash grids shall be properly sized to provide even distribution of air throughout the entire filter bed when air is applied at a rate of 3 cfm/sf of bed area. Installation by CONTRACTOR.
- B. Each in-bed air scour grid system shall consist of rigid schedule 304 SST pipe headers and ABS underdrain nozzles. Laterals shall be cut to proper length. The pipe headers shall be rigidly supported at points not exceeding 5 ft centers.

2.8 FILTRATION MEDIA

- A. Provide pyrolusite treatment media with a thirty-six (36) inch depth. The media will be installed by the General CONTRACTOR based on the SUPPLIER's recommended practices. The pyrolusite media must be certified to NSF/ANSI Standard 61.
- B. Provide recommended gravel media(s) separating the treatment media from the underdrain system. Gravel media must be "water treatment" quality, washed and screened, and shipped in clearly marked one hundred (100#) pound bags. The gravel must meet the requirements of the American Water Works Association (AWWA) Specification number B-100.

2.9 BACKWASH

- A. Backwash water will be disposed of in the OWNER's sanitary sewer collection system. Backwash flow rate to sanitary sewer collection system cannot exceed 430 gpm.
- B. Include a combined water and air scour backwash option system. Simultaneous air-water backwashing must provide air up to the rate of 3 cfm/sq. ft. at 5 psi and water rate of 5 gpm/sf for a minimum of 5 minutes based on actual operating conditions.
- C. Design the backwash system with treated source water only. Design filter such that treated water flow rate of all filter cells minus one is equivalent to or greater than backwash flow rate required for one filter cell.
- D. Under normal operation parameters, filter must be capable of providing a minimum treated water flow to distribution system of 670 gpm during backwash operations.
- E. Provide backwash flow controls for regulating the flow rate so that the maximum backwash loading rate is not exceeded. Refer to Performance Requirements included in this Section.

2.10 FILTER EXTERIOR VALVING

- A. All valves must be pressure rated consistently with the pressure rating of the filter tanks.
- B. Provide all flanged valves with Type 316 stainless steel bolts and nuts and EPDM gaskets.
- C. Maximum height of valves above finish floor is 60" with the exception of air release valves for each cell.
- D. Electrically Actuated Valves:
 - 1. Bray Series 30/31 with Series 70 actuators.
 - 2. Service:
 - a) Six (6) – raw water valves (open/close)
 - b) Six (6) – backwash waste valves (open/close)
 - c) Six (6) – filtered water valves (open/close with limit stop)
 - d) Six (6) – backwash supply valves
 - e) Two (2) – high-rate backwash flow control valves (modulating)
 - f) Two (2) – low-rate backwash supply valves (open/close with limit stop)
 - g) Six (6) – air scour valves (open/close)
 - h) Two (2) – filter-to-waste valves (open/close with limit stop)

- E. All manual isolation valves, 2-inch and smaller: ball valve type.
- F. Automatic Air Release Valves
 - 1. Automatic air release system, consisting of Val-Matic or equal air/vacuum combination release valve for each cell, brass ball valves, and stainless steel piping shipped in pieces for field assembly by the CONTRACTOR. Sizing as determined by SUPPLIER's design.

2.11 FILTER SYSTEM PIPING

- A. Water Piping
 - 1. Exterior piping. AWWA C115 cement mortar lined ductile iron pipe with ductile iron flanges with AWWA C110 flange connections.
 - 2. No direct taps allowed. Use saddle taps or Onyx PSR isolator rings with NSF-61 EPDM rubber sleeve.
 - 3. All interior piping per Part 2.1.B this section to be sandblasted per SSPC SP-10 and shop applied NSF/ANSI Standard 61 epoxy.
 - 4. All piping exterior surfaces are to be sandblasted per SSPC SP-6 and shop applied primer.
 - 5. Finish coating of the piping exterior is to be field applied by the CONTRACTOR in accordance with SUPPLIER recommendation and OWNER Specification.
 - 6. Furnish all filter system face and interconnecting pipe with Type 316 stainless steel bolts and nuts and ethylene propylene diene monomer rubber (EPDM) gaskets.

2.12 COATING SYSTEMS

- A. Comply with this Section and AWWA standards, whichever is more stringent, for all coated equipment.
- B. SUPPLIER to provide finish coating of the tank exterior prior to delivery to OWNER.
- C. Filter Tank Internal
 - 1. Thoroughly clean tank interior removing all dirt, grease, etc. prior to sand blasting and coating.
 - 2. Surface preparation: abrasive blast. Conform to the requirements of SSPC-SP10 "Near White Blast Cleaning" with a minimum angular anchor profile of 1.5 mils. Paint all blasted surfaces within 8 hours of blasting. Remove all weld splatter by grinding or chipping prior to sandblasting.

3. Coat tank interiors in accordance with AWWA D 102-21. Minimum system consists of:
 - a) Prime coat: 6.0 – 8.0 dry film thickness.
 - b) Stripe coat: on all welds and seams, 2.0 – 4.0 mils dry film thickness.
 - c) Finish coat: 6.0 – 8.0 mils dry film thickness.
4. Coating material: Tnemec Series 21 Epoxoline or equal.
5. Products used must be NSF 61 and NSF 600 certified for potable water application.
6. Color: see Part 1.4.B.6(b) in Section 11100. Prime coat color to be different than other coats in order for OWNER to differentiate in photographs provided.
7. Perform holiday/continuity testing in accordance with ASTM D 5162. Correct all defects identified from testing and re-test until passing results are obtained.
8. Provide written documentation of results to OWNER prior to shipment. Documentation to include:
 - a) Internal coating preparation and coating application including prime, intermediate, stripe and final coats and final mil thickness for each.
 - b) Provide surface preparation, deburring inspection and cure times documentation.
 - c) Photos of surface preparation and each coating stage.

D. Filter Tank Exterior

1. Surface preparation: abrasive blast. Conform to the requirements of SSPC-SP6 "Commercial Blast Cleaning." Coat all blasted surfaces within 8 hours of blasting. Remove all weld splatter by grinding or chipping prior to sandblasting.
2. Prime coat: one (1) prime coat (6 - 8 mils DFT) of Tnemec Series 21 Epoxoline.
3. Stripe coat: on all welds and seams, 2.0 – 4.0 mils dry film thickness.
4. Final coat: 6 – 8 mils DFT Tnemec Series 21 Epoxoline.
5. Products used must be NSF 61 certified for potable water application.
6. Perform holiday/continuity testing in accordance with ASTM D 5162 and provide written documentation of results prior to shipment.

E. Pressure Vessel Coatings Application Inspection and Report

1. All surface preparation and coating operations shall be monitored 100% by a third-party coating inspection firm that is certified as an SSPC: The Society for Protective Coatings QP5 Coating inspection firm (SSPC-QP5 Certified Firm).
 - a) The coatings inspection firm shall provide a full report on internal coating preparation and application inspection for record in submittal to OWNER prior to shipment of the pressure vessel.
 - b) At a minimum, the inspection report shall include photos, measurements, findings, recommendations, and final approvals of the following painting steps:
 - 1) Blasting and deburring inspection
 - 2) Prime Coat
 - 3) Stripe Coat
 - 4) Intermediate Coat
 - 5) Final Coat
 - 6) Holiday test results and touch up required. Holiday/continuity testing shall be conducted in accordance with ASTM D5162. Correct any defects found during testing and re-test until passing results are obtained.
 - c) The cost of third-party coatings inspection and testing shall be paid by the SUPPLIER.

F. Piping

1. Ductile iron mechanical face piping and fittings furnished by the SUPPLIER shall be supplied with one exterior coat of shop-applied epoxy or zinc-based primer.
2. The topcoat applied to ductile iron mechanical face piping and fittings shall be field applied by the CONTRACTOR in accordance with SUPPLIER recommendation and OWNER Specification.
3. Valves shall be furnished with a fusion-bonded epoxy exterior coating system or equivalent shop-applied by the valve manufacturer.

2.13 SYSTEM ACCESSORIES

A. FILTER PRESSURE EQUIPMENT

1. Furnish liquid filled pressure gauges for each filter cell inlet and outlet with 4.5" diameter dials, bronze bourdon tubes, designed to measure and display pressures 0 to 160 psig.
2. Furnish each pressure gauge with brass fittings and manual isolating valves.
3. Pressure transducers must be provided on both influent and effluent sides of the overall filter system: Endress Hauser Ceraphant PTC31B- 1-600 psi.

B. SAMPLING PORTS

1. Provide sampling ports upstream and downstream of the overall filter system and on the outlet of each filter cell. Sampling ports shall include Apollo 70LF-100 series full port ball valve, or approved equal, so that a sample line may be routed to an easy to reach location. Sampling taps to be provided by the SUPPLIER and installed in the field by the CONTRACTOR.

C. FLOW MEASURING DEVICE

1. Flow meters: McCrometer Ultra Mag electromagnetic flow meter with AMI output.
2. Flow meter service:
 - a) Total influent flow.
 - b) Filter effluent flow, each cell (three required).
 - c) Total effluent flow.
 - d) Backwash flow.

D. AIR SCOUR BLOWER

1. Blower accessories shall consist of intake air filter, intake silencer, discharge silencer, pressure relief valve, pressure relief valve silencer, check valve, intake and outlet flexible connections, and pressure gauge.
2. Air scour piping exterior to the filter shall be schedule 10 stainless steel. Air scour piping shall be looped above the filter.

E. ORIFICE PLATES

1. Orifice plates shall be provided as necessary to drop pressure and prevent cavitation during backwash and filter-to-waste steps.
2. Supplier shall provide orifice plate sizing.

2.14 EXTRA MATERIALS/ SPARE PARTS

- A. SUPPLIER to deliver extra materials to OWNER. Furnish extra materials matching products installed as described below. Package them with protective covering for storage and label clearly describing contents.

1. 6 manway gaskets.
2. 1 valve of each size & type.

2.15 CONTROL SYSTEMS

- A. General Requirements:

1. The filter control system shall be designed to interface with the OWNER's SCADA system and shall provide monitoring and control of the filter system on site or remotely through an Ethernet/IP connection.
2. Programming of the filtration control system, including the filtration system PLC, integration with all treatment-related instrumentation, and integration with automated equipment furnished as part of the SUPPLIER's control system, shall be the responsibility of the SUPPLIER.
3. Programming of Well 24 control system, including the well facility PLC, well pump variable frequency drive, flow and pressure instrumentation not provided by the SUPPLIER, and other equipment or instrumentation not furnished by the SUPPLIER as part of the SUPPLIER's control system, shall be the responsibility of the OWNER and/or CONTRACTOR.
4. The SUPPLIER shall provide the necessary I/O ports for communication between the filtration system PLC and the well facility PLC as defined in this Specification.
5. The OWNER will provide Valve & Instrumentation Tags prior to start of submittals.
6. SUPPLIER will provide all equipment, hardware, and software necessary to fulfill all the functional requirements of a properly functional water filtration system for the removal of manganese and iron.

- B. Backwash Initiation and Control Requirements: The filter system shall allow for simultaneous air-water backwash and water-only backwash media rinse as described below.

1. Simultaneous air-water backwash: The simultaneous air-water backwash process shall be the primary method used to clean the filter media and shall be automatically initiated through one of the following modes:

- a) **Mode 1:** Backwash is triggered using a weekly time-based schedule. The schedule shall provide two (2) adjustable time setpoints for each day of the week that will initiate a backwash cycle regardless of differential pressure. The control system shall allow each time setpoint to be enabled or disabled separately.
 - 1) If both setpoints for a day are disabled, backwash for that day shall be initiated as described below in Mode 2.
 - 2) If the differential pressure setpoints described in Mode 2 are reached before the next scheduled backwash, backwash shall be initiated based on the control logic for Mode 2 described below.
 - b) **Mode 2:** Backwash is triggered by exceedance of a differential pressure setpoint across the filtration system. The system shall provide the following three OWNER-adjustable differential pressure setpoints:
 - 1) Normal Differential Pressure: If the filter differential pressure exceeds the normal differential pressure setpoint, a backwash cycle shall occur provided the setpoint is exceeded within an OWNER-adjustable daily time window. If the normal differential pressure setpoint is exceeded outside the daily time window, backwash will be delayed and normal operation will continue until within the daily time window.
 - 2) High Differential Pressure: If the high differential pressure setpoint is exceeded, all backwash frequency-limiting settings shall be overridden and a backwash shall be initiated regardless of the day of the week or time of day. If a backwash is triggered under the high differential pressure setpoint, a high-pressure alarm shall be sent to the OWNER's SCADA system.
 - 3) High Alarm/Shutdown Differential Pressure: If the filter differential pressure exceeds the high alarm/shutdown differential pressure setpoint, the filter control system shall send a signal to the OWNER's control system to shut down the Well 24 pump and motor and initiate an overpressure shutdown alarm in the OWNER's SCADA system.
 - 4) Each differential pressure setpoint shall operate in conjunction with an adjustable timer interlock setpoint to prevent short-term pressure spikes or fluctuations from triggering a backwash cycle.
2. A filter to waste cycle shall be provided as the last step in backwash operation in both operational modes. The time duration

of the filter to waste cycle shall be adjustable through the filtration system HMI.

3. Water-only backwash media rinse: The filter system shall be furnished with the ability to allow a water-only media rinse to be manually initiated by the treatment system operator.

C. Air Piping Condensate Purge Control Valve Requirements:

1. The filtration control system shall operate an air condensate purge control valve through an electric actuator (Bray Series 70 or equal).
2. The control valve and actuator shall be furnished by SUPPLIER and installed by CONTRACTOR at a low point in the air supply piping between the blower and the filtration pressure vessel.
3. The filtration control system shall be programmed to open the control valve prior to blower startup when a backwash cycle is initiated to allow condensate to drain from the blower discharge piping for a user-adjustable time period. After the timer has expired, the control system shall close the control valve and allow the blower to start.
4. The position of the control valve shall be indicated on the filtration control system HMI.

D. Well 24 Control Requirements:

1. The control system shall allow communication via an Ethernet/IP connection with the OWNER's control network to provide the following functions:
 - a. The filtration system HMI shall allow adjustment of the filtration rate through communication with the OWNER's control network. Control of the Well 24 pumping rate to the filtration system shall be accomplished by the OWNER's control network.
 - b. The filtration control system shall communicate the beginning and end of a filter cell backwash cycle with the OWNER's control network to allow the Well 24 pumping rate to be reduced to maintain a constant hydraulic loading rate on the filter cells that are not in backwash mode.

E. Minimum Filtration System Remote Control Requirements:

1. The control system shall allow remote control of the following filtration system functions through an Ethernet/IP connection with the OWNER's control network:

- a. Initiate filter system backwash event.
- b. Terminate filter system backwash event.
- c. Start and stop filter system.
- d. Adjust the pumping rate through the filter system.
- e. Change backwash cycle setpoints for differential pressure and time schedule.

F. Chlorination System Control Requirements:

- 1. The control system shall allow remote control (start/stop/auto/hand) of the chlorine metering pump to be provided by the CONTRACTOR. The metering pump shall operate whenever the Motor Drive is on, the motor reports a running status, and flow is physically being measured through the Well Production Meter when in automatic mode.
- 2. The metering pump shall be controlled using a 4 – 20 mA analog pacing signal from the raw water flow meter to provide flow-proportional chemical dosing. Analog signal scaling shall be performed using the metering pump local controls.

G. Alarms:

- 1. Alarms shall be logged and displayed on local control panel HMI and relayed to the OWNER's SCADA system, including the time and date stamp reflecting the occurrence and nature of the alarm.

H. Control System Components:

- 1. Power supply, terminal blocks and relays to be Allen-Bradley to conform to City's standard and spare parts inventory.
- 2. The control panel shall include a Toshiba UPS with Kendall Howard mount and contact card for the UPS. Size PLC control panel to allow UPS to be door mounted. Vendor panel to come with UPS bypass. C&C Power Model 93802, sized as appropriate, is preferred.
- 3. The instrumentation and control system shall be the SUPPLIER's standard system, except as modified and specified herein.
- 4. PLC enclosure: NEMA 12 powder coated carbon steel.
- 5. PLC shall be Allen-Bradly CompactLogix platform:
 - a. Controller – 5069-L306ER
 - b. Digital Inputs – 5069-IB16
 - c. Digital Outputs – 5069-OB16
 - d. Analog Inputs – 5069-IY4
 - e. Analog Outputs - 5069-OF4
 - f. HMI – PanelView Plus 1250

6. PLC programming software shall be AB Studio 5000 V32.
 7. PLC panel wiring requirements:
 - a. Provide one fused terminal block with blown fuse LED for each group of 8 digital inputs.
 - b. Provide one fused terminal block and one ground terminal block for each analog input signal.
 - c. Provide 20% spare area for future terminal blocks and I/O cards.
 8. Provide 100% spare fuses for PLC panel.
- I. Control System HMI Screen Contents and System Monitoring Requirements:
1. A separate NEMA 12 power coated carbon steel enclosure to house the HMI shall be provided with means to connect back to the PLC control panel enclosure.
 2. The screens and menus displayed in the control system HMI shall match the layout and provide the information shown in the following table. OWNER will coordinate with SUPPLIER to establish the items to be included in the control system HMI during the design and procurement process. The information provided below is intended to establish a minimum standard for the level of control and monitoring to be provided by SUPPLIER'S HMI. Additional information, menus, setpoints, and other necessary monitoring and control information may be included if provided by SUPPLIER as part of SUPPLIER'S standard control system, or if required for SUPPLIER to provide a complete and functional filtration system.

Meridian Well 24 HMI Screen Information Summary Table			
Screen Name	Screen No.	Screen Description	Screen Components
Main Menu	1	Provides menu access to filter monitoring and operating menus	System Monitor
			System Setup Menu
			Backwash Monitor
			Filter Cell Manual Control
			Well Facility Equipment Control
			Flow Totalizer Summary
			Backwash Schedule Setpoints
			Backwash Headloss Setpoints
			Backwash Time Window Setpoints
			Backwash Time Schedule
			Alarm History and Event Log
System Monitor	2	Provides monitoring and status of facility equipment	Display Well Pump Status (Remote/On/Off/Auto)
			Display Airwash Blower Status (Remote/On/Off/Auto)
			Display Chlorine Metering Pump Status (Remote/On/Off/Auto)
			Display Raw Water Free/Total Chlorine (ppm)
			Display Finished Water Free/Total Chlorine (ppm)
			Display Raw Water Flow Rate (gpm)
			Display Individual Cell Flow Rates (gpm)
			Display Finished Water Flow Rate (gpm)
			Display Backwash Flow Rate (gpm)
			Display Bypass Flow Rate (gpm)
			Display Differential Pressure (psi)

			Display Electronic Control Valve Status (Open/Closed/Position/Local/Remote)
Backwash Monitor	3	Provides monitoring and status of backwash process	Well Pump Status (Remote/On/Off/Auto)
			Airwash Blower Status (Remote/On/Off/Auto)
			Display Backwash Flow Rate (gpm)
			Display Backwash in Progress (Yes/No)
			Display Current Backwash Cycle Step
			Display Backwash Step/Cycle Timer (minutes remaining)
			Backwash Type Initiation (Headloss/Schedule/Both)
Filter Cell Manual Control	4 - 6	Provide manual control of actuated valves and system status. Provide one screen for each filter cell.	Well Pump Status (Remote/On/Off/Auto)
			Airwash Blower Status (Remote/On/Off/Auto)
			Filter Cell Operating Mode (Manual/Auto)
			Display Raw Water Flow Rate (gpm)
			Display Individual Cell Flow Rates (gpm)
			Display Finished Water Flow Rate (gpm)
			Display Backwash Flow Rate (gpm)
			Display Bypass Flow Rate (gpm)
			Electronic Valve Actuator Control (Status/Open/Close/Local/Remote)
			Backwash Initiation (Start/Stop)
Well Facility Equipment Control	7	Provide control and monitoring of well facility equipment not furnished by SUPPLIER	Blower Control (Start/Stop/Auto)
			Well Pump Control (Call/Lockout/Auto/Remote)
			Chlorine Metering Pump (Start/Stop/Auto)
			Blower Run Fault Setpoint (secs)

			Well Pump Run Fault Setpoint (secs)
Flow Totalizer Summary	8	Display flow meter totalizer values for raw water (total), raw water (per cell), backwash, finished water, and bypass flow	Display Current Day (kgal)
			Display Previous Week (each day, total for week, kgal)
			Display Previous Month (kgal)
			Display Total to Date (kgal)
			Totalizer Reset (yes/no)
Backwash Schedule Setpoints	9	Display setpoints for each step of the backwash cycle and the elapsed time for each step during a backwash cycle	Cell Isolation Setpoint (min)
			Cell Draindown Setpoint (min)
			Air/Water Backwash Setpoint (min)
			Purge Cell Setpoint (min)
			Refill Cell Setpoint (min)
			Repressurize Cell Setpoint (min)
			Filter to Waste Setpoint (min)
			Delay between Cell Backwashes Setpoint (min)
Backwash Headloss Setpoints	10	Display differential pressure setpoints and time interlock setpoints for backwash cycle	Normal Differential Pressure Setpoint (psid)
			High Differential Pressure Setpoint (psid)
			High Alarm/Shutdown Differential Pressure Setpoint (psid)
			Timer Interlock (min, each differential pressure setpoint)
			Display Current Timer Interlock Value (min, each differential pressure setpoint, when timer active)
			Display Current Differential Pressure (psid)
Backwash Window Setpoints	11	Allows adjustment of time window when backwash on normal differential pressure setpoint is permitted	Backwash Allowed (Yes/No, each hour, 24-hour clock)
			Current Time Display (24-hour clock)
	12		Time Setpoint (2 setpoints/day, HR:MM, 24-hour clock)

Backwash Schedule Setpoints		Allows adjustment of weekly schedule for backwashing at set times.	Time Setpoint Active (enable/disable)
Alarm History	13	Display alarm history and allow acknowledgement of alarms	Display alarm date/time, acknowledgement time, and alarm message
			Display current date/time
			Acknowledge single alarm (yes/no)
			Acknowledge all alarms (yes/no)
Event Log	14	Display record of events logged automatically. Coordinate event logging requirements with OWNER.	Display event date/time and message
			Display current date/time
System Setup Menu	15	Navigation to instrument and alarm calibration/configuration screens	Display SCADA communications status (connected/not connected)
			Toggle SCADA control (on/off)
			Navigate to analog output scaling adjustment menus for flow meters, differential pressure transmitter, and chlorine analyzers
			Navigate to limit switch fault setpoint configuration menu
			Navigate to alarm configuration menu
			Navigate to time/date set menu
Analog Output Scaling	16	Allow adjustment of the value of the process variable for 4 mA and 20 mA analog instrument outputs	4 mA Process Variable Setpoints (flow meters, free/total chlorine analyzers, differential pressure transmitter)
			20 mA Process Variable Setpoints (flow meters, free/total chlorine analyzers, differential pressure transmitter)
			Display current process variable value (flow meters, free/total chlorine analyzers, differential pressure transmitter)
Limit Switch Fault Setpoints	17	Allow adjustment of delay time setpoints for electronic actuated valve fault indication/alarming	Limit switch time delay setpoints (each electronically actuated valve, seconds)

Alarm Configuration Menu	18	Allows enabling/disabling system alarms. Coordinate list of required alarms with OWNER.	Alarm Type (enable/disable)
--------------------------	----	---	-----------------------------

PART 3 EXECUTION

3.1 SHIPMENT

- A. Coordinate delivery of all equipment and materials with the CONTRACTOR and deliver all equipment and materials specified in this and other sections to the project site. See Section 01010 for project site location.
- B. Package and ship all equipment and materials in a manner that protects them from damage during transport.
- C. Prior to transfer to the OWNER and CONTRACTOR, the SUPPLIER's representative, OWNER, and CONTRACTOR must be present at time of delivery to inspect the equipment or materials. Any damage, defects, or non-compliance with approved submittals or these Specifications will be documented.
- D. Equipment or materials not accepted by the OWNER at time of delivery, either due to damage or non-compliance, will be replaced by the SUPPLIER in a timely manner and at the SUPPLIER's expense.
- E. Coordinate unloading with the CONTRACTOR and OWNER.

3.2 INSTALLATION

- A. Perform installation inspection in accordance with this Section and Section 01400.

3.3 START-UP

- A. Perform system start-up in accordance with this Section, Section 01400, and the City's standard Commissioning Checklist for Treatment Facilities.

3.4 SUPPLEMENTS

- A. The following supplements, attached herein, are considered part of this Section:
 - 1. Pilot Study Report for City of Meridian, ID Wells 26 & 24 dated July 13, 2021.
 - 2. City of Meridian Public Works Water Facilities Design checklist.

END OF SECTION

APPENDIX A - WELL 24 PILOT TEST REPORT

This report is included as an appendix for the convenience of the SUPPLIER in preparing a proposal and is not part of the contract documents. Actual conditions at Well 24 may differ from those contained in this report.

This page intentionally blank.



Pilot Study Report

on

WRT/Loprest Div. Filtration System for Iron & Manganese Removal



conducted by

**Loprest, a division of WRT
Westminster, Colorado**

for the

**City of Meridian, ID
Wells No. 26 & 24
PWS ID # 4010097
Job # L33668
Meridian, ID
July 13, 2021**

TABLE OF CONTENTS

1.0	EXECUTIVE SUMMARY/CONCLUSIONS	3
2.0	THE WRT/LOPREST FILTRATION SYSTEM AND STUDY OVERVIEW	4
2.1	Iron and Manganese Removal.....	5
3.0	TEST EQUIPMENT DESCRIPTION	5
3.1	Pilot Study Equipment and Process Flow Diagram	8
3.2	WRT/Loprest Pilot Study Equipment Photos.....	9
4.0	RAW WATER ANALYTICAL DATA	10
4.1	Statement of Purpose	10
5.0	PILOT TEST PROTOCOL	10
5.1	Operating Procedures and Performance Testing	10
5.1.1	Preparation of Chemical Solutions.....	10
5.1.2	Operating Procedure	11
5.1.3	Sampling Protocol.....	12
5.1.4	Sample Tests	12
5.1.5	Onsite Test Equipment, Procedures, and Methods	12
6.0	TREATMENT PERFORMANCE EVALUATION	13
6.1	Filter Head Loss.....	13
6.2	Breakpoint Chlorination.....	14
6.3	Iron and Manganese Treatment.....	16
7.0	PERFORMANCE EVALUATION NOTES	23
7.1	Contaminant removal	23
7.2	Pressure loss.....	23
7.3	Recommendations.....	23
APPENDIX A		25
APPENDIX B		66

1.0 EXECUTIVE SUMMARY/CONCLUSIONS

The City of Meridian is plans to add treatment for iron and manganese for well sites 26 and 24. Iron and manganese are the primary constituents of concern for these two sites, having been sampled above or near their secondary maximum contaminant levels. The City of Meridian asked WRT/Loprest Division to complete pilot studies at each site for water sources to remove these constituents in preparation for full-scale treatment. The pilot study was conducted to evaluate two filtration media types designed for iron and manganese removal.

Well 26 is permitted to flow at 2,500 gpm, meanwhile Well 24 can flow at 1,800 gpm. Manganese levels are suspected to exceed the Idaho State secondary MCL value for drinking water of 0.05 mg/L in both raw waters. And dissolved iron is also present in both wells, but below its corresponding secondary MCL. In testing, measured iron levels in Well 24 were much less than originally reported. Concentrations of ammonia are low at both sites, though samples were analyzed for ammonia nitrogen to assess its effect on chlorination and residuals of free chlorine. Based off previous pilots conducted at Meridian well sites, WRT/Loprest Division selected two water treatment media systems for testing. Both medias are notable for their demonstrated effectiveness at removing iron and manganese. In line with these expectations, both media systems treated iron and manganese below secondary MCL values for both well sites.

The project specifications require finished water from both wells be treated in accordance with USEPA and State of Idaho primary and secondary MCL standards for drinking water. State of Idaho secondary MCL values for iron and manganese are 0.3 mg/L total iron and 0.05 mg/L total manganese. The pilot test contaminant removal goals are treated water concentrations less than Idaho state drinking water standards while providing an ample chlorine residual post-treatment.

Three (3) filter runs were conducted using both media types at each site to assess their contaminant removal effectiveness and their effects on ammonia reduction. Each of the filter runs had a service period of 8 hours followed by a backwash using treated water. Recommended chlorine doses for full oxidation and removal of iron and manganese are applied during the first filter run as determined via breakpoint chlorination tests conducted at each well. The second and third filter runs at each site help to demonstrate repeatable treatment results and further assess ammonia oxidation capability of both medias. Metal contaminant iron and manganese removal is the primary objective of the pilot studies. The filter columns are operated within the maximum industry standard hydraulic loading rate for iron and manganese removal and as recommended by the filter media manufacturers. Sodium hypochlorite (NaOCl) feeding rates are adjusted to maintain free chlorine residuals of at least 1 mg/L in the finished treated water.

The first media type, media F1, is a mixed bed of Inversand's GreensandPlus® granular media and anthracite coal with a hypochlorite reagent feed to generate available free chlorine oxidant as pretreatment. Pressure losses in F1 systems gradually increased during

Well 26 filter runs and remained steady for Well 24 filter runs, never dropping more than 3.8 psi across all runs. F1 filter runs removed iron to nondetectable levels and manganese to 0.033 mg/L using field analytical methods. These systems were also able to reduce most if not all the ammonia present while conserving 85% of influent free chlorine, on average.

The second media system tested, media F2, tradename Mang-Ox[®], is a granular manganese oxide media. This media received the same hypochlorite pretreatment as the F1 systems. On average, F2 systems usually had lower pressure losses than their F1 counterparts, and with comparable removal performances for all contaminants across all filter runs. The most notable difference between filter media being that F2 systems consumed more free chlorine presumably due to superior catalytic ammonia oxidation capability.

Most field samples for ammonia nitrogen in raw water were measured below 0.1 mg/L, and reached maximums of 0.24 mg/L. Removal performance for ammonia was typically greater than 90%, save for a measured 85% ammonia removal for F1 systems at Well 26. Higher ammonia in Well 26 raw water corresponded to a higher breakpoint for sodium hypochlorite to generate a free chlorine residual above 1 mg/L wherein 2.6 mg/L is required compared to 1.9 mg/L in Well 24 raw water.

Iron and manganese are treatable using either filter media, with similar performance between medias at both well sites. Backwashes at either site will likely be initiated on a basis of pressure loss at Well 26 and contaminant breakthrough for Well 24. With the test conditions encountered at these two (2) well water sources, an estimated theoretical solids loading capacity is achieved in 72 hrs. of filter service time for Well 26 water and more than approximately 7 days in Well 24 raw water before a filter cleaning backwash cycle is required. A maximum recommended service period before a backwash cleaning cycle is 7 days for a full-scale system designed using either media type. Increasing hypochlorite dosing by roughly 20% above breakpoint was shown to reduce dissolved ammonia and effectively managing residual free chlorine in the filter effluent on both filter systems.

2.0 THE WRT/LOPREST FILTRATION SYSTEM AND STUDY OVERVIEW

The WRT/Loprest system removes iron and manganese contaminants from drinking water in a downflow filtration media process using chemical oxidation and co-precipitation. Solid phase metal oxide contaminants are physically separated from the water stream, collected within a packed media bed and safely removed during a backwash operation. The backwash wastewater from the filter is directed to an on-site collection tank for disposal. The process has been designed for simplicity of operation minimal maintenance and reliable operation. The filtration system is similarly designed for versatility to adapt to the requirements of each well-specific treatment facility.

Several media types have demonstrated effective catalytic oxidation properties and can be used to facilitate the oxidation process. Depending upon the specific water conditions and

corresponding water quality, oxidative media types will perform differently. This pilot study is conducted using two selected media types for side-by-side comparative assessment of the iron and manganese removal performance as well as measured ammonia immediately following media contact for treating these raw ground water sources. A manganese dioxide media trade named Mang-Ox[®] and a proprietary product from Inversand Co. trademarked GreensandPlus[®] are tested in two 30-inch tall parallel filter columns.

2.1 Iron and Manganese Removal

The most common method of removing iron and manganese from water involves the oxidation of soluble iron (Fe^{+2} , or ferrous ion) and manganese (Mn^{+2} , or manganous ion) to insoluble forms (Fe^{+3} , ferric ion, and Mn^{+4} , tetravalent manganese ion), and subsequent removal of the precipitates formed using filtration.

Mang-Ox[®] is an 80% pure manganese dioxide ore, mined and screened for potable water use. In waters with a positive oxidation/reduction potential (ORP), it can work without the use of an oxidant. Other manganese dioxide ore materials mixed with a variety of sand materials are available under various trade names.

GreensandPlus[®] is a manganese dioxide coated media with a silica sand core. It requires oxidant addition prior to media contact. Chlorine is the most common oxidant; however other oxidants are effective. The manganese dioxide coating acts as a catalyst in the oxidation process of both iron and manganese.

These medias are evaluated in this testing. F1 filter column contained GreensandPlus[®] media and F2 filter column contained Mang-Ox[®] media.

3.0 TEST EQUIPMENT DESCRIPTION

WRT/Loprest division's filter pilot test equipment is installed in a 16 ft. x 8 ft. trailer. The pilot test components are installed and pre-plumbed in the trailer for single-point supply and discharge connection at the test site. The filtration equipment includes three (3) test media filtration columns, chlorination and chemical feed addition, and all automated filtration backwash piping valves and instrumentation and process control equipment. Refer to Figure 1 for the pilot equipment general process flow diagram. The following equipment is installed in the trailer unit:

- Three (3) Pulsafeeder metering pumps, with a maximum injection flow rate of 3.0 GPD, each with a dedicated solution tank and a 100 mL calibration cylinder. One pump will be used to inject sodium hypochlorite oxidizing reagent, and the second pump will be used to inject ferric chloride (if required). A third chemical injection pumping system is provided for pH control acid addition should this be required. Two chemical reagent metering pumps are required for this pilot test.

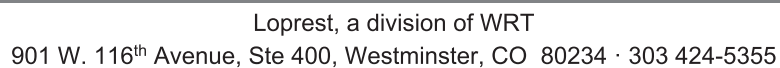
- Three (3) vertical pressure filter vessels constructed of Sch 40 PVC pipe, nominal 6-inch outside diameter (6.03 inches inside diameter) by 65-1/2 inches straight side height, cross sectional area of 0.1963 sq. ft. including flow distribution internal piping, manual and automatically controlled valves, instrumentation and controls, and filtration media bed as follows:
 - Slotted stainless steel strainer underdrain
 - Upper surface wash header/distributor
 - 30 to 36 inches of 20 x 60 mesh prewashed filtration media
 - 6 inches of 1/8-inch x 1/4-inch washed gravel sub fill
 - Automatic and separate manually operated valves to control filtration, rinse to waste, surface wash and backwash flow sequences
 - Pressure indicators on inlet and outlet flow piping
 - Vessel-mounted air release valve
 - Inlet and outlet valve sample ports
 - Rate of flow indicators for the service inlet, backwash, and surface wash flow streams
- An air-scour wash system is included for media cleaning backwash.
- A 200-gallon polyethylene storage tank and backwash pump. The storage tank is used to store filtered water for filter backwash operations.
- PLC-based control panel, which automatically controls the filter control valves, subsurface wash and backwash pump during filter cleaning sequences. Filter cleaning sequence initiation can be controlled using elapsed service time, filter differential pressure, or manually. It is anticipated that pressure filter differential pressure will be used as the primary filter cleaning sequence initiation followed by elapsed service time initiation during this pilot testing.
- Additional portable test equipment as follows:
 - Hach DR 900 Portable Colorimeter and accompanying reagent packs for free chlorine measurement, ammonia as well as iron and manganese measurements.
 - LaMotte DC1500 free chlorine test kit for free chlorine analysis.
 - Portable handheld probe and analyzer for pH

The source water enters the pilot test unit from a connection to the raw water pressurized supply line through a hose connection to the WRT/Loprest filtration system trailer. Raw water sampling occurs at this location referred to as SP1 on the process flow diagram. The water is first directed to the filter column service inlet piping where ferric chloride and oxidant (sodium hypochlorite) reagents are added to the raw water. The pretreated water then enters the top of each media treatment column. The treated water exits the bottom of each treatment column where it is directed to the main discharge piping and out through the outlet connection on the trailer. Each treatment column is equipped with a valved effluent sample connection labeled SP2, SP3 and SP4.

The media filter columns are backwashed automatically using one of several backwash trigger points set at the PLC controller. Set points for filter backwash can be initiated manually, by operating time interval, by filter differential pressure loss or by filtered water

discharge conditions. Based upon the filter run requirements and the testing protocol for the test(s) a filter backwash frequency is selected. Backwashing of the filter units is accomplished by directing treated and finished water from the integrated treated water collection tank. Backwash water supply and a mixed pressurized air supply is directed automatically to each filter column sequentially up flow through the media column to expand the media bed and release the collected solids to exit the out of the top of the filter media column. The backwashed liquid and solids are sent to the wastewater discharge connection on the trailer and directed to a backwash waste collection tank for offsite disposal.

Figure 1. Pilot Study Equipment Process flow diagram



3.2 WRT/Loprest Pilot Study Equipment Photos



Photo 1. Filter test column unit

Photo 2. Filter pilot trailer



Photo 3. Reagent chemical pumping system

4.0 RAW WATER ANALYTICAL DATA

A comparison of the raw water constituent levels presented in the project specifications (parenthetical figures) vs. those measured onsite are summarized below. All analytical results can be found in Appendix A of this report. Iron was sampled at levels lower than anticipated in Well 24, though contaminant concerns reported by the City of Meridian were otherwise confirmed by field and lab results.

TABLE 1
RAW FEED WATER CHARACTERISTICS
Concentrations expressed as average influent conditions (owner provided)

Constituent	Well No. 26	Well No. 24
Iron, total, mg/L	0.26 (0.21)	0.01 (0.13)
Manganese, total, mg/L	0.058 (0.1)	0.061 (0.1)
Ammonia, mg/L as N	0.09 (0.063)	0.03 (ND)

4.1 Statement of Purpose

Manganese levels in water obtained from the City of Meridian Wells 26 and 24 exceed the State of Idaho Drinking Water secondary drinking water MCL value of 0.05 mg/L. Owner-provided and field measurements for dissolved iron did not return concentrations higher than the corresponding secondary MCL value of 0.3 mg/L. The purposes of this study are to evaluate the removal performance of iron and manganese from the raw water supply by both media types for the purposes of full-scale treatment implementation at well sites 26 and 24 and ensure regulatory compliance for manganese in finished water.

5.0 PILOT TEST PROTOCOL

The pilot test consisted of three separate runs for each media type. The flow rate was 1.5 gpm for an 8 gpm/square foot treatment rate in the filter column for all filter runs.

5.1 Operating Procedures and Performance Testing

This section describes the steps and procedures that were followed during the onsite pilot study. One of the first steps was the preparation of chemical feed stock solutions.

5.1.1 Preparation of Chemical Solutions

Sodium hypochlorite (6.0%) was used to prepare the chlorine solution used during Well 26 filter runs. The dilution factor for the chlorine solution was 1.9 liters of 6 percent sodium hypochlorite into 10 gals of water.

Sodium hypochlorite (7.5%) was used to prepare the chlorine solution used during Well 24 filter runs. The dilution factor for the chlorine solution was 2 liters of 7.5 percent sodium hypochlorite into 10 gals of water.

5.1.2 Operating Procedure

The pilot filter columns were loaded, backwashed, and initially preconditioned at the WRT/Loprest facility. The source of water for the first backwash was potable water from the local potable water distribution system at WRT's facility. After the first backwash, the filtered water from the pilot unit was used for backwashing. Column media was then preconditioned with approximately 4 percent hypochlorite solution for 12 hours. The same media used for the earlier City of Meridian tests was used for the Well 24 and Well 26 testing. Following filter testing at three City of Meridian well sites, the media columns were manually backwashed twice and preconditioned with a chlorine solution prior to the start of the tests.

Three runs for each media type were conducted to demonstrate iron and manganese and removal and ammonia reduction capability. Following the conclusion of the three-run pilot test at each well source, the pilot system is relocated to the next well water source for a three-run test. The filter columns were operated continuously for an extended service cycle exceeding the typical backwash frequency to assess actual pressure loss and contaminant removal performance. Each filter run is separated using a backwash cycle. Sodium hypochlorite was added during all filter runs according to the preparation instructions in Section 5.1.1 and the breakpoint chlorination assessments detailed in Section 6.2. The dosing rates for each chemical are recorded on the pilot test log sheets in Appendix B.

TABLE 2
PILOT RUN FEEDS AND FILTER SYSTEMS

Filter Run	Raw Water Source	Media Type
No. 1	Well 24	F1: GreensandPlus [®] /Anthracite
		F2: Mang-Ox [®]
No. 2	Well 24	F1: GreensandPlus [®] /Anthracite
		F2: Mang-Ox [®]
No. 3	Well 24	F1: GreensandPlus [®] /Anthracite
		F2: Mang-Ox [®]
No. 4	Well 26	F1: GreensandPlus [®] /Anthracite
		F2: Mang-Ox [®]
No. 5	Well 26	F1: GreensandPlus [®] /Anthracite
		F2: Mang-Ox [®]
No. 6	Well 26	F1: GreensandPlus [®] /Anthracite
		F2: Mang-Ox [®]

The backwash cycle was completed in two steps: 1) draindown and air scour for 2 minutes to simulate a full-scale backwash and air scour wash combined for at a flow rate of 5 gpm/ft² for backwash and 1 scfm/ ft² air scour then 2) backwash to waste for an additional 6 minutes at 12 gpm/ft² (GreensandPlus[®]) and 20 gpm/ft² (MangOx[®]) then 3) rinse to waste for 4 minutes at the service flow rate. Air scour addition with the backwash water is used to improve backwash efficiency. Effluent water was accumulated for use as backwash supply water.

During each filter run, measurements were taken and recorded at regular intervals for the following parameters:

1. filter rate of flow, gpm
2. sodium hypochlorite addition rate, mL/min
3. filter inlet and outlet free chlorine, mg/L
4. filter inlet and outlet total iron, mg/L
5. filter inlet and outlet manganese, µg/L
6. filter inlet and outlet pressure, psi
7. filter inlet and outlet nitrate, mg/L as N

The above data was recorded on pilot test log sheets, which are included in the Appendix B of this report.

5.1.3 Sampling Protocol

All inorganic water analyses were performed an external laboratory certified by the National Environmental Laboratory Accreditation Program. All samples are drawn into clean sample containers provided by the analytical laboratory and preserved for metal analysis. Chain of custody documentation is completed, and samples transported to the laboratory for immediate analysis. Test samples are submitted to Eurofins Eaton Analytical in Monrovia, California for analysis using EPA and Idaho state recognized testing methods for drinking water.

Methods for analysis are:

Total Iron	EPA 200.7
Total Manganese	EPA 200.7
Ammonia Nitrogen	EPA 350.1

5.1.4 Sample Tests

Free chlorine, iron, manganese, ammonia nitrogen, and pH were tested onsite using the instruments and procedures described in the following section. Each filter influent and effluent sample was taken in enough volume to provide the required volume for each parameter to be tested. Sample volumes were sufficient to provide a sample for offsite testing as well. The Owner's representative collected samples for the offsite independent lab analysis.

5.1.5 Onsite Test Equipment, Procedures, and Methods

Field testing for iron, manganese and ammonia nitrogen are performed with a Hach DR 900. With this instrument, a sample placed within a sample cell, measured twice in the instrument by insertion into the test instrument in two steps, once as a blank for zero setting and again after sample preparation with packet(s) of reagents specific for each constituent. One sample called the blank, is inserted into the DR 900 first, and the instrument is zeroed.

The DR 900 measures the amount of light passing through the blank sample and electronically stores the result. Next, the second prepared sample is inserted, and the value is read by the DR 900. The instrument compares the stored value for the blank to the value for the prepared sample and displays the results for the constituent being tested.

For manganese, the blank is prepared with deionized water. The iron test blanks are prepared with water from the filter effluent. The test results are displayed on the digital readout. For iron, the Total Iron, FerroVer test Method 8008 is used. For manganese, Method 8149 is used. Ammonia nitrogen tests are performed using Method 8155.

Chlorine analysis is performed on a LaMotte DC1500 using the DPD Method. This test is equivalent to Standard Method 4500-C1 G.

pH is measured using an Oakton pH Acorn Series Pocket pH Tester with a range of 0.0 – 10.0 pH. The probe was calibrated daily using a 7.0 pH buffer solution.

6.0 TREATMENT PERFORMANCE EVALUATION

This section provides a performance summary of the equipment and media types evaluated during the pilot test. Refer to Section 3.0 for a complete description and specification of the pilot test equipment and field analysis test equipment.

6.1 Filter Head Loss

Head loss behavior was consistent between medias, but not between the well systems tested. Pressure loss through the filter media increased for both medias during Well 26 filter runs whereas pressure losses held steady during filter runs performed for Well 24. Table 3 below illustrates the contrasting trend between well sites. Well 26 pilot systems operated under increasing pressure losses with inconsistent starting and ending values. Inlet and outlet gauge pressures and calculations for pressure loss are visible in Section 6.3 and the pilot log sheets in Appendix B.

TABLE 3
PRESSURE DIFFERENCE AND RELATIVE STANDARD DEVIATION
PILOT FILTER RUNS 1-6
JUNE 8-14, 2021

Well No.	Filter Runs	GreensandPlus® (F1)		Mang-Ox® (F2)	
		Mean DP, psid	RSD, %	Mean DP, psid	RSD, %
26	1-3	3.1	14.9	2.6	19.5
24	4-6	2.3	2.7	1.9	3.0

6.2 Breakpoint Chlorination

To determine the necessary dose rates for free chlorine residuals of at least 1 mg/L, breakpoint chlorination tests were performed at both wells using the hypochlorite solutions detailed in Section 5.1.1. Figures 2 and 3 display the data from these tests. Recommended hypochlorite doses are estimated for the exceedance of 1 mg/L of free chlorine after the breakpoint, at roughly 2.6 mg/L and 1.9 mg/L of NaOCl for Well 26 and Well 24 respectively. All filter runs operated at hypochlorite addition rates approximately 30% higher than these rates.

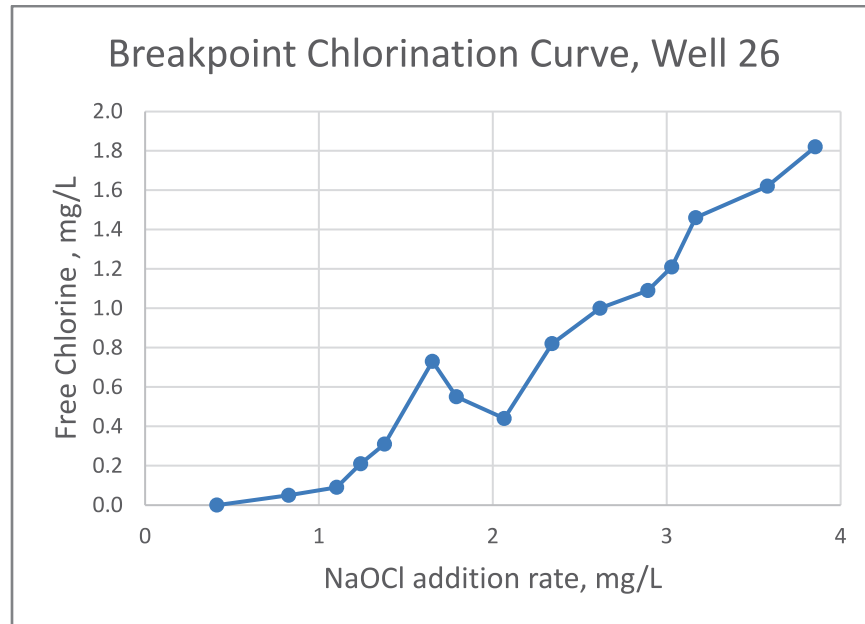


FIGURE 2
WELL 26 BREAKPOINT CHLORINATION CURVE

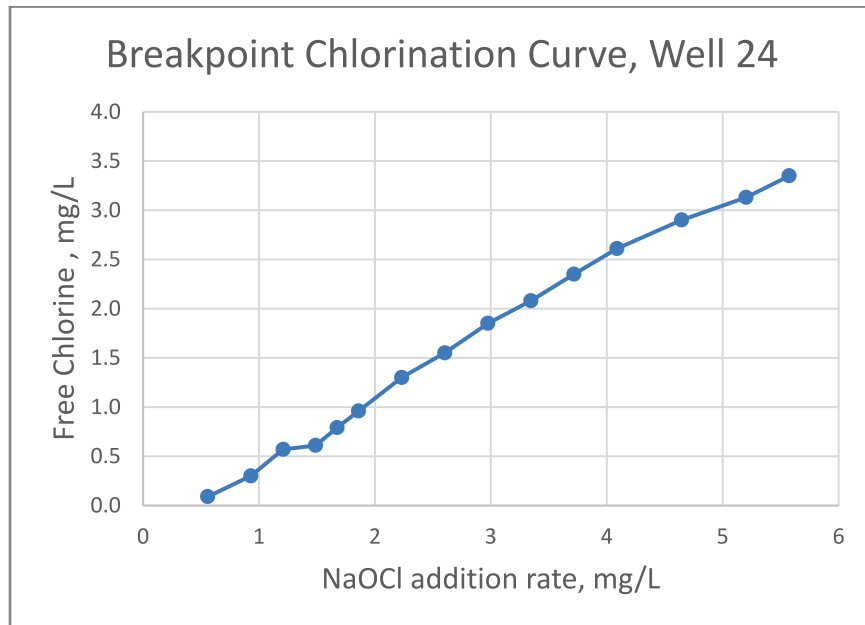


FIGURE 3
WELL 24 BREAKPOINT CHLORINATION CURVE

6.3 Iron and Manganese Treatment

A summary of the influent and filtered concentrations for iron, manganese, and ammonia is presented in Tables 4 through 15. Test results labeled “field” are test results from the Hach DR 900 and field test kits, and those labeled “lab” are from Eurofins Test Laboratories off-site analysis.

TABLE 4
CHLORINE, IRON, MANGANESE AND AMMONIA TEST RESULTS
WELL 26, MEDIA #F1 RUN #1
JUNE 8, 2021

ANALYTE	Hours of Service						
	0.5	1	2.5	4.5	6.5	7.5	8
NaOCl feed rate, mL/min, field	11.5	11.5	11	11	11.5	11	
Cl (free) in, mg/L, field (pretreated)		1.18	1.28	1.54	1.27	1.24	
Cl (free) filter out, mg/L, field		1.04	1.08	1.09	1.07	1.10	
Fe in, mg/L, field (raw)	0.18		0.20	0.17	0.20		
Fe in, mg/L, lab (raw)		0.25					
Fe filter out, mg/L, field	0		0	0	0		
Fe filter out, mg/L, lab		0.034		0.018		0.012	
Mn in, mg/L, field (raw)	0.076		0.061	0.056	0.038		
Mn in, mg/L, lab (raw)		0.058					
Mn filter out, mg/L, field	0.010		0.005	0.001	0.001		
Mn filter out, mg/L, lab		0.0059		0.0033		0.0027	
NH ₃ -N in, mg/L, field (raw)	0.24		0.22	0.04	0.04		
NH ₃ -N in, mg/L, lab (raw)		0.061					
NH ₃ -N filter out, mg/L, field	0.05		0.08	0	0		
NH ₃ -N filter out, mg/L, lab		ND		ND		ND	
DP, psid		2.4	2.8	3	3	3.2	3.2

NOTES: F1 Media = GreensandPlus®/Anthracite

Flow = 1.5 GPM

TABLE 5
CHLORINE, IRON, MANGANESE AND AMMONIA TEST RESULTS
WELL 26, MEDIA #F2 RUN #1
JUNE 8, 2021

ANALYTE	Hours of Service						
	0.5	1	2.5	4.5	6.5	7.5	8
NaOCl feed rate, mL/min, field	11.5	11.5	11	11	11.5	11	
Cl (free) in, mg/L, field (pretreated)		1.18	1.28	1.54	1.27	1.24	
Cl (free) filter out, mg/L, field		0.86	0.75	0.72	0.76	0.78	
Fe in, mg/L, field (raw)	0.18		0.20	0.17	0.20		
Fe in, mg/L, lab (raw)		0.25					
Fe filter out, mg/L, field	0		0	0	0		
Fe filter out, mg/L, lab		0.033		0.021		0.012	
Mn in, mg/L, field (raw)	0.076		0.061	0.056	0.038		
Mn in, mg/L, lab (raw)		0.058					
Mn filter out, mg/L, field	0.008		0.006	0.007	0.003		
Mn filter out, mg/L, lab		0.0049		0.0038		0.0029	
NH ₃ -N in, mg/L, field (raw)	0.24		0.22	0.04	0.04		
NH ₃ -N in, mg/L, lab (raw)		0.061					
NH ₃ -N filter out, mg/L, field	0		0.03	0	0		
NH ₃ -N filter out, mg/L, lab		ND		ND		ND	
DP, psid		2	2.1	2.3	2.5	2.7	2.7

NOTES: F2 Media = Mang-Ox[®]

Flow = 1.5 GPM

TABLE 6
CHLORINE, IRON, MANGANESE AND AMMONIA TEST RESULTS
WELL 26, MEDIA #F1 RUN #2
JUNE 9, 2021

ANALYTE	Hours of Service					
	0.7	1	2.6	4.5	6.6	7.5
NaOCl feed rate, mL/min, field	12		12	11	11	11
Cl (free) in, mg/L, field (pretreated)	1.28		1.18	1.13	1.27	1.14
Cl (free) filter out, mg/L, field	1.19		0.99	1.01	1.01	0.99
Fe in, mg/L, field (raw)	0.21		0.23	0.23	0.27	
Fe in, mg/L, lab (raw)						
Fe filter out, mg/L, field	0		0	0	0	
Fe filter out, mg/L, lab		0.031		0.013		ND
Mn in, mg/L, field (raw)	0.052		0.058	0.054	0.058	
Mn in, mg/L, lab (raw)						
Mn filter out, mg/L, field	0.004		0.004	0	0.001	
Mn filter out, mg/L, lab		0.0037		0.0023		ND
NH ₃ -N in, mg/L, field (raw)	0.08		0.12	0.10	0.13	
NH ₃ -N in, mg/L, lab (raw)						
NH ₃ -N filter out, mg/L, field	0.02		0.03	0.02	0.07	
NH ₃ -N filter out, mg/L, lab		ND		ND		ND
DP, psid	2.4	2.6	2.7	3.0	3.4	3.6

NOTES: F1 Media = GreensandPlus[®]/Anthracite

Flow = 1.5 GPM

TABLE 7
CHLORINE, IRON, MANGANESE AND AMMONIA TEST RESULTS
WELL 26, MEDIA #F2 RUN #2
JUNE 9, 2021

ANALYTE	Hours of Service					
	0.7	1	2.6	4.5	6.6	7.5
NaOCl feed rate, mL/min, field	12		12	11	11	11
Cl (free) in, mg/L, field (pretreated)	1.28		1.18	1.13	1.27	1.14
Cl (free) filter out, mg/L, field	0.86		0.75	0.76	0.69	0.73
Fe in, mg/L, field (raw)	0.21		0.23	0.23	0.27	
Fe in, mg/L, lab (raw)						
Fe filter out, mg/L, field	0		0	0	0	
Fe filter out, mg/L, lab		0.036		0.019		0.014
Mn in, mg/L, field (raw)	0.052		0.058	0.054	0.058	
Mn in, mg/L, lab (raw)						
Mn filter out, mg/L, field	0.003		0.007	0	0.008	
Mn filter out, mg/L, lab		0.0052		0.0024		0.0022
NH ₃ -N in, mg/L, field (raw)	0.08		0.12	0.10	0.13	
NH ₃ -N in, mg/L, lab (raw)						
NH ₃ -N filter out, mg/L, field	0		0	0	0.03	
NH ₃ -N filter out, mg/L, lab		ND		ND		ND
DP, psid	2.0	2.1	2.2	2.5	2.9	3.0

NOTES: F2 Media = Mang-Ox[®]

Flow = 1.5 GPM

TABLE 8
CHLORINE, IRON, MANGANESE AND AMMONIA TEST RESULTS
WELL 26, MEDIA #F1 RUN #3
JUNE 10, 2021

ANALYTE	Hours of Service					
	0.5	0.8	2.8	4.8	6.5	7.5
NaOCl feed rate, mL/min, field	12		12/13	13	13	
Cl (free) in, mg/L, field (pretreated)	1.31		1.13	1.32	1.28	
Cl (free) filter out, mg/L, field	1.15		0.99	0.95	1.19	
Fe in, mg/L, field (raw)	0.28		0.35	0.33	0.34	
Fe in, mg/L, lab (raw)		0.36				
Fe filter out, mg/L, field	0		0	0	0	
Fe filter out, mg/L, lab		0.027		0.011		ND
Mn in, mg/L, field (raw)	0.059		0.066	0.061	0.058	
Mn in, mg/L, lab (raw)		0.060				
Mn filter out, mg/L, field	0.003		0.005	0.006	0.005	
Mn filter out, mg/L, lab		0.0039		ND		ND
NH ₃ -N in, mg/L, field (raw)	0.07		0.05	0.07	0.04	
NH ₃ -N in, mg/L, lab (raw)		0.060				
NH ₃ -N filter out, mg/L, field	0		0	0	0	
NH ₃ -N filter out, mg/L, lab		ND		ND		ND
DP, psid	2.5		2.9	3.4	3.7	

NOTES: F1 Media = GreensandPlus®/Anthracite

Flow = 1.5 GPM

TABLE 9
CHLORINE, IRON, MANGANESE AND AMMONIA TEST RESULTS
WELL 26, MEDIA #F2 RUN #3
JUNE 10, 2021

ANALYTE	Hours of Service					
	0.5	0.8	2.8	4.8	6.5	7.5
NaOCl feed rate, mL/min, field	12		12/13	13	13	
Cl (free) in, mg/L, field (pretreated)	1.31		1.13	1.32	1.28	
Cl (free) filter out, mg/L, field	0.91		0.67	0.83	0.86	
Fe in, mg/L, field (raw)	0.28		0.35	0.33	0.34	
Fe in, mg/L, lab (raw)		0.36				
Fe filter out, mg/L, field	0.02		0.04	0.04	0	
Fe filter out, mg/L, lab		0.032		0.015		0.012
Mn in, mg/L, field (raw)	0.059		0.066	0.061	0.058	
Mn in, mg/L, lab (raw)		0.060				
Mn filter out, mg/L, field	0.010		0.013	0.007	0.006	
Mn filter out, mg/L, lab		0.0031		0.0025		0.0021
NH ₃ -N in, mg/L, field (raw)	0.07		0.05	0.07	0.04	
NH ₃ -N in, mg/L, lab (raw)		0.060				
NH ₃ -N filter out, mg/L, field	0		0.02	0	0	
NH ₃ -N filter out, mg/L, lab		ND		ND		ND
DP, psid	2.2		2.5	3.1	3.5	

NOTES: F2 Media = Mang-Ox®

Flow = 1.5 GPM

TABLE 10
CHLORINE, IRON, MANGANESE AND AMMONIA TEST RESULTS
WELL 24, MEDIA #F1 RUN #1
JUNE 12, 2021

ANALYTE	Hours of Service					
	0.3	1.3	2.3	4.3	6.3	7.3
NaOCl feed rate, mL/min, field	6		6/7	7	7	7
Cl (free) in, mg/L, field (pretreated)	1.31		1.10	1.40	1.31	1.36
Cl (free) filter out, mg/L, field	1.23		1.00	1.16	1.21	1.25
Fe in, mg/L, field (raw)	0		0.03	0.03	0.03	
Fe in, mg/L, lab (raw)		0.017				
Fe filter out, mg/L, field	0		0	0	0	
Fe filter out, mg/L, lab		ND		ND		ND
Mn in, mg/L, field (raw)	0.176		0.050	0.054	0.056	
Mn in, mg/L, lab (raw)		0.040				
Mn filter out, mg/L, field	0		0	0.019	0.024	
Mn filter out, mg/L, lab		ND		ND		ND
NH ₃ -N in, mg/L, field (raw)	0.02		0	0.03	0.02	
NH ₃ -N in, mg/L, lab (raw)		ND				
NH ₃ -N filter out, mg/L, field	0		0	0.02	0	
NH ₃ -N filter out, mg/L, lab		ND		ND		ND
DP, psid	2.2	2.3	2.2	2.2	2.3	2.3

NOTES: F1 Media = GreensandPlus®/Anthracite

Flow = 1.5 GPM

TABLE 11
CHLORINE, IRON, MANGANESE AND AMMONIA TEST RESULTS
WELL 24, MEDIA #F2 RUN #1
JUNE 12, 2021

ANALYTE	Hours of Service					
	0.3	1.3	2.3	4.3	6.3	7.3
NaOCl feed rate, mL/min, field	6		6/7	7	7	7
Cl (free) in, mg/L, field (pretreated)	1.31		1.10	1.40	1.31	1.36
Cl (free) filter out, mg/L, field	0.78		0.71	0.79	0.80	0.86
Fe in, mg/L, field (raw)	0		0.03	0.03	0.03	
Fe in, mg/L, lab (raw)		0.017				
Fe filter out, mg/L, field	0		0	0	0	
Fe filter out, mg/L, lab		ND		ND		ND
Mn in, mg/L, field (raw)	0.176		0.050	0.054	0.056	
Mn in, mg/L, lab (raw)		0.040				
Mn filter out, mg/L, field	0		0	0.012	0.023	
Mn filter out, mg/L, lab		ND		ND		ND
NH ₃ -N in, mg/L, field (raw)	0.02		0	0.03	0.02	
NH ₃ -N in, mg/L, lab (raw)		ND				
NH ₃ -N filter out, mg/L, field	0		0	0	0	
NH ₃ -N filter out, mg/L, lab		ND		ND		ND
DP, psid	1.9	1.9	1.9	2.0	1.9	2.0

NOTES: F2 Media = Mang-Ox®

Flow = 1.5 GPM

TABLE 12
CHLORINE, IRON, MANGANESE AND AMMONIA TEST RESULTS
WELL 24, MEDIA #F1 RUN #2
JUNE 13, 2021

ANALYTE	Hours of Service						
	0.4	0.9	1.4	2.8	4.7	6.7	7.7
NaOCl feed rate, mL/min, field	7	7		7	7	7	
Cl (free) in, mg/L, field (pretreated)	1.55	1.36		1.42	1.28	1.28	
Cl (free) filter out, mg/L, field	1.25	1.22		1.19	1.10	1.18	
Fe in, mg/L, field (raw)		0		0	0	0	
Fe in, mg/L, lab (raw)							
Fe filter out, mg/L, field		0		0	0	0	
Fe filter out, mg/L, lab			ND		ND		ND
Mn in, mg/L, field (raw)		0.055		0.056	0.051	0.050	
Mn in, mg/L, lab (raw)							
Mn filter out, mg/L, field		0.210		0.026	0.019	0.021	
Mn filter out, mg/L, lab			ND		ND		ND
NH ₃ -N in, mg/L, field (raw)		0.01		0.02	0	0	
NH ₃ -N in, mg/L, lab (raw)							
NH ₃ -N filter out, mg/L, field		0		0	0	0	
NH ₃ -N filter out, mg/L, lab			ND		ND		ND
DP, psid	2.2	2.3	2.2	2.3	2.3	2.4	2.3

NOTES: F1 Media = GreensandPlus®/Anthracite

Flow = 1.5 GPM

TABLE 13
CHLORINE, IRON, MANGANESE AND AMMONIA TEST RESULTS
WELL 24, MEDIA #F2 RUN #2
JUNE 13, 2021

ANALYTE	Hours of Service						
	0.4	0.9	1.4	2.8	4.7	6.7	7.7
NaOCl feed rate, mL/min, field	7	7		7	7	7	
Cl (free) in, mg/L, field (pretreated)	1.55	1.36		1.42	1.28	1.28	
Cl (free) filter out, mg/L, field	0.92	0.86		0.77	0.79	0.79	
Fe in, mg/L, field (raw)		0		0	0	0	
Fe in, mg/L, lab (raw)							
Fe filter out, mg/L, field		0		0	0	0	
Fe filter out, mg/L, lab			ND		ND		ND
Mn in, mg/L, field (raw)		0.055		0.056	0.051	0.050	
Mn in, mg/L, lab (raw)							
Mn filter out, mg/L, field		0.024		0.021	0.017	0.016	
Mn filter out, mg/L, lab			ND		ND		ND
NH ₃ -N in, mg/L, field (raw)		0.01		0.02	0	0	
NH ₃ -N in, mg/L, lab (raw)							
NH ₃ -N filter out, mg/L, field		0		0	0	0	
NH ₃ -N filter out, mg/L, lab			ND		ND		ND
DP, psid	1.9	1.9	2.0	1.9	1.9	2.0	1.9

NOTES: F2 Media = Mang-Ox®

Flow = 1.5 GPM

TABLE 14
CHLORINE, IRON, MANGANESE AND AMMONIA TEST RESULTS
WELL 24, MEDIA #F1 RUN #3
JUNE 14, 2021

ANALYTE	Hours of Service					
	0.4	0.9	2.9	3.9	4.9	6.9
NaOCl feed rate, mL/min, field	7	7	7		7	7
Cl (free) in, mg/L, field (pretreated)	1.17	1.23	1.19		1.31	1.25
Cl (free) filter out, mg/L, field	1.07	1.10	1.01		1.18	1.17
Fe in, mg/L, field (raw)		0.02	0		0	0.03
Fe in, mg/L, lab (raw)				0.010		
Fe filter out, mg/L, field		0	0		0	0
Fe filter out, mg/L, lab		ND		ND		ND
Mn in, mg/L, field (raw)		0.054	0.063		0.059	0.051
Mn in, mg/L, lab (raw)				0.037		
Mn filter out, mg/L, field		0.023	0.013		0.023	0.018
Mn filter out, mg/L, lab		ND		ND		ND
NH ₃ -N in, mg/L, field (raw)		0.03	0.04		0.02	0.20
NH ₃ -N in, mg/L, lab (raw)				ND		
NH ₃ -N filter out, mg/L, field		0	0		0	0
NH ₃ -N filter out, mg/L, lab		ND		ND		ND
DP, psid	2.4	2.3	2.3	2.3	2.2	2.2

NOTES: F1 Media = GreensandPlus®/Anthracite

Flow = 1.5 GPM

TABLE 15
CHLORINE, IRON, MANGANESE AND AMMONIA TEST RESULTS
WELL 24, MEDIA #F2 RUN #3
JUNE 14, 2021

ANALYTE	Hours of Service					
	0.4	0.9	2.9	3.9	4.9	6.9
NaOCl feed rate, mL/min, field	7	7	7		7	7
Cl (free) in, mg/L, field (pretreated)	1.17	1.23	1.19		1.31	1.25
Cl (free) filter out, mg/L, field	0.81	0.80	0.82		0.79	0.78
Fe in, mg/L, field (raw)		0.02	0		0	0.03
Fe in, mg/L, lab (raw)				0.010		
Fe filter out, mg/L, field		0	0		0	0
Fe filter out, mg/L, lab		ND		ND		ND
Mn in, mg/L, field (raw)		0.054	0.063		0.059	0.051
Mn in, mg/L, lab (raw)				0.037		
Mn filter out, mg/L, field		0.014	0		0.019	0.026
Mn filter out, mg/L, lab		ND		ND		ND
NH ₃ -N in, mg/L, field (raw)		0.03	0.04		0.02	0.20
NH ₃ -N in, mg/L, lab (raw)				ND		
NH ₃ -N filter out, mg/L, field		0	0		0	0
NH ₃ -N filter out, mg/L, lab		ND		ND		ND
DP, psid	1.9	2.0	1.8	2.0	2.0	2.0

NOTES: F2 Media = Mang-Ox®

Flow = 1.5 GPM

7.0 PERFORMANCE EVALUATION NOTES

This pilot study confirmed both medias as viable choices for treating iron and manganese to compliance with USEPA and Idaho State drinking water standards. Both medias removed iron and manganese to below the secondary MCL standard for each. Performance differences between GreensandPlus® and Mang-Ox® are difficult to quantify given the results, although the latter had marginally better reduction of ammonia with double the consumption of free chlorine.

The columns were operated at 8 gpm/ft² and dosed to achieve a free chlorine residual of at least 1 mg/L. Varied feed rates were used between filter runs at each well to determine the optimal chlorine dose, depending on the catalytic properties of both medias and reduction of other contaminants such as ammonia.

7.1 Contaminant removal

There are no outstanding differences in contaminant removal performance for Well 26 tests. GreensandPlus® filter effluent had total iron removal, 0.004 mg/L manganese, and 0.02 mg/L ammonia nitrogen. Meanwhile Mang-Ox® filter effluent had 0.01 mg/L iron, 0.007 mg/L manganese, and 0.01 mg/L ammonia nitrogen. Notable however, is that GreensandPlus® had higher free chlorine residuals by at least 35%.

Total removal of iron, as well as ammonia, was observed at Well 24 for both media systems. GreensandPlus® runs for this well had roughly double the effluent concentration of total manganese however, only treating to 0.033 mg/L versus 0.014 mg/L using Mang-Ox®. Greensand® yielded higher free chlorine residuals for these filter runs, but by 43% for Well 24.

7.2 Pressure loss

Pressure losses during Well 26 filter runs rose during service flows for both media types, ranging between 2 and 3.8 psid. The minimum and maximum head loss in both filters increased each service cycle for the three filter runs performed. Mang-Ox® tended to have lower starting head loss, though matched the pressure losses of GreensandPlus® during the third filter run. This may be attributed to the higher measured iron level in the raw water.

Pressure losses during service runs remained steady for both media systems. As seen in Table 3 in Section 6.1, average pressure losses were between 1.9 and 2.3 psid and relative standard deviation below 5%. Backwashes also appeared to be successful at resetting filter operating conditions.

7.3 Recommendations

GreensandPlus® is the recommended media type for treatment at Well 26. It will be a more cost-effective choice for the same removal performance with metals and ammonia, while

maintaining a higher residual free chlorine. Head loss averaged 0.5 psid greater for GreensandPlus[®], though operating pressures increased similarly with each filter run.

Mang-Ox[®] is the recommended media type for treatment at Well 24. This media had favorable operating conditions and performance across the board. The two most distinct advantages are lower pressure losses through the media and almost double the manganese removal efficiency of GreensandPlus[®].

APPENDIX A

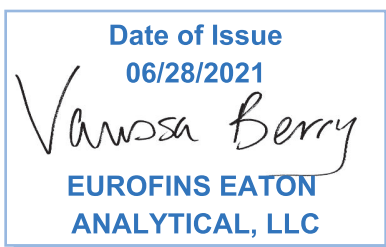
Analytical Test Results
Page 25 - 65

750 Royal Oaks Drive, Suite 100
Monrovia, California 91016-3629
Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Report

for

City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300
Attention: Jason Smith



Utah ELCP CA00006

ZIA8: Vanessa Berry
Project Manager

Report: 941321
Project: SPECIAL
Group: Pilot Study

* Accredited in accordance with TNI 2016 and ISO/IEC 17025:2017.

* Laboratory certifies that the test results meet all **TNI 2016 and ISO/IEC 17025:2017** requirements unless noted under the individual analysis.

* Following the cover page are State Certification List, ISO 17025 Accredited Method List, Acknowledgement of Samples Received, Comments, Hits Report, Data Report, QC Summary, QC Report and Regulatory Forms, as applicable.

* Test results relate only to the sample(s) tested.

* Test results apply to the sample(s) as received, unless otherwise noted in the comments report (ISO/IEC 17025:2017).

* This report shall not be reproduced except in full, without the written approval of the laboratory.

* This report includes ISO/IEC 17025 and non-ISO 17025 accredited methods.

STATE CERTIFICATION LIST

State	Certification Number	State	Certification Number
Alabama	41060	Montana	Cert 0035
Arizona	AZ0778	Nebraska	Certified
Arkansas	Certified	Nevada	CA000062018
California	2813	New Hampshire *	2959
Colorado	Certified	New Jersey *	CA 008
Connecticut	PH-0107	New Mexico	Certified
Delaware	CA 006	New York *	11320
Florida *	E871024	North Carolina	06701
Georgia	947	North Dakota	R-009
Guam	18-005R	Oregon *	CA200003-005
Hawaii	Certified	Pennsylvania *	68-565
Idaho	Certified	Puerto Rico	Certified
Illinois *	200033	Rhode Island	LAO00326
Indiana	C-CA-01	South Carolina	87016
Iowa - Asbestos	413	South Dakota	Certified
Kansas *	E-10268	Tennessee	TN02839
Kentucky	90107	Texas *	T104704230-18-15
Louisiana *	LA180000	Utah (Primary AB) *	CA00006
Maine	CA0006	Vermont	VT0114
Maryland	224	Virginia *	460260
Commonwealth of Northern Marianas Is.	MP0004	Washington	C838
Massachusetts	M-CA006	EPA Region 5	Certified
Michigan	9906	Los Angeles County Sanitation Districts	10264
Mississippi	Certified		

* NELAP/TNI Recognized Accreditation Bodies

ISO/IEC 17025 Accredited Method List

The tests listed below are accredited and meet the requirements of ISO/IEC 17025 as verified by the ANSI-ASQ National Accreditation Board/A2LA.
Refer to Certificate and scope of accreditation (5890) found at: <https://www.eurofinsus.com/Eaton>

SPECIFIC TESTS	METHOD OR TECHNIQUE USED	Environ-mental (Drinking Water)	Environ-mental (Waste Water)	Water as a Component of Food and Bev/Bev/ Bottled Water
1,2,3-TCP (5 PPT & 0.5 PPT)	CA SRL 524M-TCP	x		x
1,4-Dioxane	EPA 522	x		x
2,3,7,8-TCDD	Modified EPA 1613B	x		x
Acrylamide	In House Method (2440)	x		x
Algal Toxins/Microcystin	In House Method (3570)			
Alkalinity	SM 2320B	x	x	x
Ammonia	EPA 350.1		x	x
Ammonia	SM 4500-NH3 H		x	x
Anions and DBPs by IC	EPA 300.0	x	x	x
Anions and DBPs by IC	EPA 300.1	x		x
Asbestos	EPA 100.2	x	x	
BOD / CBOD	SM 5210B		x	x
Bromate	In House Method (2447)	x		x
Carbamates	EPA 531.2	x		x
Carbonate as CO3	SM 2330B	x	x	x
Carbonyls	EPA 556	x		x
COD	EPA 410.4 / SM 5220D		x	
Chloramines	SM 4500-CL G	x	x	x
Chlorinated Acids	EPA 515.4	x		x
Chlorinated Acids	EPA 555	x		x
Chlorine Dioxide	SM 4500-CLO2 D Palin Test	x		x
Chlorine -Total/Free/ Combined Residual	SM 4500-Cl G	x	x	x
Conductivity	EPA 120.1		x	
Conductivity	SM 2510B	x	x	x
Corrosivity (Langelier Index)	SM 2330B	x		x
Cyanide, Amenable	SM 4500-CN G	x	x	
Cyanide, Free	SM 4500CN F	x	x	x
Cyanide, Total	EPA 335.4	x	x	x
Cyanogen Chloride (screen)	In House Method (2470)	x		x
Diquat and Paraquat	EPA 549.2	x		x
DBP/HAA	SM 6251B	x		x
Dissolved Oxygen	SM 4500-O G		x	x
DOC	SM 5310C	x		x
E. Coli	(MTF/EC+MUG)	x		x
E. Coli	CFR 141.21(f)(6)(i)	x		x
E. Coli	SM 9223		x	
E. Coli (Enumeration)	SM 9221B.1/ SM 9221F	x		x
E. Coli (Enumeration)	SM 9223B	x		x
EDB/DCBP	EPA 504.1	x		
EDB/DBCP and DBP	EPA 551.1	x		x
EDTA and NTA	In House Method (2454)	x		x
Endothall	EPA 548.1	x		x
Endothall	In-house Method (2445)	x		x
Enterococci	SM 9230B	x	x	
Fecal Coliform	SM 9221 E (MTF/EC)	x		
Fecal Coliform	SM 9221C, E (MTF/EC)		x	
Fecal Coliform (Enumeration)	SM 9221E (MTF/EC)	x		x
Fecal Coliform with Chlorine Present	SM 9221E		x	
Fecal Streptococci	SM 9230B	x	x	
Fluoride	SM 4500-F C	x	x	x
Glyphosate	EPA 547	x		x
Glyphosate + AMPA	In House Method (3618)	x		x
Gross Alpha/Beta	EPA 900.0	x	x	x
Gross Alpha Coprecipitation	SM 7110 C	x	x	x
Hardness	SM 2340B	x	x	x
Heterotrophic Bacteria	In House Method (2439)	x		x
Heterotrophic Bacteria	SM 9215 B	x		x
Hexavalent Chromium	EPA 218.6	x	x	x

SPECIFIC TESTS	METHOD OR TECHNIQUE USED	Environ-mental (Drinking Water)	Environ-mental (Waste Water)	Water as a Component of Food and Bev/Bev/ Bottled Water
Hexavalent Chromium	EPA 218.7	x		x
Hexavalent Chromium	SM 3500-Cr B		x	
Hormones	EPA 539	x		x
Hydroxide as OH Calc.	SM 2330B	x		x
Kjeldahl Nitrogen	EPA 351.2		x	
Legionella	Legiolert	x		x
Mercury	EPA 200.8	x		x
Metals	EPA 200.7 / 200.8	x	x	x
Microcystin LR	ELISA (2360)	x		x
Microcystin, Total	EPA 546	x		x
NDMA	EEA/Agilent 521.1 In house method (2425)	x		x
Nitrate/Nitrite Nitrogen	EPA 353.2	x	x	x
OCL, Pesticides/PCB	EPA 505	x		x
Ortho Phosphate	EPA 365.1	x	x	x
Ortho Phosphorous	SM 4500P E	x		x
Oxyhalides Disinfection Byproducts	EPA 317.0	x		x
Perchlorate	EPA 331.0	x		x
Perchlorate (low and high)	EPA 314.0	x		x
Perfluorinated Alkyl Acids	EPA 537	x		x
Perfluorinated Pollutant	In house Method (2434)	x		x
pH	EPA 150.1	x		
pH	SM 4500-H+B	x	x	x
Phenylurea Pesticides/ Herbicides	In House Method, based on EPA 532 (2448)	x		x
Pseudomonas	IDEXX Pseudalart (2461)	x		x
Radium-226	GA Institute of Tech	x		x
Radium-228	GA Institute of Tech	x		x
Radon-222	SM 7500RN	x		x
Residue, Filterable	SM 2540C	x	x	x
Residue, Non-filterable	SM 2540D		x	
Residue, Total	SM 2540B		x	x
Residue, Volatile	EPA 160.4		x	
Semi-VOC	EPA 525.2	x		x
Silica	SM 4500-Si D	x	x	
Silica	SM 4500-SiO2 C	x	x	
Sulfide	SM 4500-S ⁻ D		x	
Sulfite	SM 4500-SO ³ B	x	x	x
Surfactants	SM 5540C	x	x	x
Taste and Odor Analytes	SM 6040E	x		x
Total Coliform (P/A)	SM 9221 A, B	x		x
Total Coliform (Enumeration)	SM 9221 A, B, C	x		x
Total Coliform / E. coli	Colisure SM 9223	x		x
Total Coliform	SM 9221B		x	
Total Coliform with Chlorine Present	SM 9221B		x	
Total Coliform / E.coli (P/A and Enumeration)	SM 9223	x		x
TOC	SM 5310C	x	x	x
TOX	SM 5320B		x	
Total Phenols	EPA 420.1		x	
Total Phenols	EPA 420.4	x	x	x
Total Phosphorous	SM 4500 P E		x	
Triazine Pesticides & Degradates	In House (3617)	x		x
Turbidity	EPA 180.1	x	x	x
Turbidity	SM 2130B	x	x	
Uranium by ICP/MS	EPA 200.8	x		x
UV 254	SM 5910B	x		
VOC	EPA 524.2	x		x
VOC	In House Method (2411)	x		x
Yeast and Mold	SM 9610	x		x
Field Sampling	N/A			

Acknowledgement of Samples Received

Addr: **City of Meridian**
2235 NW 8th Street
Meridian, ID 83642-2300

Client ID: MERIDIAN-ID
Folder #: 941321
Project: SPECIAL
Sample Group: Pilot Study

Attn: Jason Smith
Phone: 208-519-0003

Project Manager: Vanessa Berry
Phone: 503-310-3905

The following samples were received from you on **June 16, 2021 at 1319**. They have been scheduled for the tests listed below each sample. If this information is incorrect, please contact your service representative. Thank you for using Eurofins Eaton Analytical, LLC.

Sample #	Sample ID	Sample Date
<u>202106170100</u>	Well 26 F1	06/09/2021 1500
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170101</u>	Well 26 RAW	06/10/2021 0845
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170102</u>	Well 26 F1	06/10/2021 0845
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170103</u>	Well 26 F2	06/10/2021 0845
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170104</u>	Well 26 F1	06/10/2021 1215
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170105</u>	Well 26 F2	06/10/2021 1215
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170106</u>	Well 26 F1	06/10/2021 1500
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170107</u>	Well 26 F2	06/10/2021 1500
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170581</u>	Well 26 RAW	06/08/2021 0830
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170582</u>	Well 26 F1	06/08/2021 0830
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170583</u>	Well 26 F2	06/08/2021 0830
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170584</u>	Well 26 F1	06/08/2021 1200
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170585</u>	Well 26 F2	06/08/2021 1200
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	

Acknowledgement of Samples Received

Addr: **City of Meridian**
2235 NW 8th Street
Meridian, ID 83642-2300

Client ID: MERIDIAN-ID
Folder #: 941321
Project: SPECIAL
Sample Group: Pilot Study

Attn: Jason Smith
Phone: 208-519-0003

Project Manager: Vanessa Berry
Phone: 503-310-3905

The following samples were received from you on **June 16, 2021** at **1319**. They have been scheduled for the tests listed below each sample. If this information is incorrect, please contact your service representative. Thank you for using Eurofins Eaton Analytical, LLC.

Sample #	Sample ID	Sample Date
<u>202106170586</u>	Well 26 F1	06/08/2021 1500
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP
<u>202106170587</u>	Well 26 F2	06/08/2021 1500
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP
<u>202106170588</u>	Well 26 F1	06/09/2021 0830
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP
<u>202106170589</u>	Well 26 F2	06/09/2021 0830
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP
<u>202106170590</u>	Well 26 F1	06/09/2021 1200
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP
<u>202106170591</u>	Well 26 F2	06/09/2021 1200
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP
<u>202106170592</u>	Well 26 F2	06/09/2021 1500
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP

Test Description



Kit Order for City of Meridian

Vanessa Berry is your Eurofins Eaton Analytical, LLC Service Manager

750 Royal Oaks Drive, Suite 100
Monrovia, California 91016-3629
(626) 386-1100 FAX (866) 988-3757

Created Date & Time: 5/3/2021 11:06:05AM

Note: Sampler Please return this paper with your samples

Kit #: 289949
Created By: Vanessa Berry - [ZIA8]
Deliver By: 05/12/2021
STG: Bottle Orders
Ice Type: W

Client ID: MERIDIAN-ID
Project Code: SPECIAL Bottle Orders
Group Name: Pilot Study
PO#/JOB#:
Description: No Schedule

Ship Sample Kits to
City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300
Attn: Jason Smith
Phone: 208-519-0003

Send Report to
City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300
Attn: Jason Smith
Phone: 208-519-0003

Billing Address
City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300
Attn: Dennis Teller
Phone: 1-208-985-1200

# of Sample Tests	Bottle Qty - Type [preservative information]	Total	UN DOT #
20 Ammonia Nitrogen	1 - 250ml poly [0.5 ml H2SO4 (50%)]	20	UN1830
20 Iron Total ICAP, Manganese Total ICAP	1 - 500ml acid poly [2ml HNO3 (18%)]	20	UN2031
Sum Tests: 40		Sum Bottles: 40	
Comments			
include return shipping labels			
COC			



Food Analytical

Kit Order for City of Meridian

Vanessa Berry is your Eurofins Eaton Analytical, LLC Service Manager

750 Royal Oaks Drive, Suite 100
Monrovia, California 91016-3629
(626) 386-1100 FAX (866) 988-3757

Created Date & Time: 5/3/2021 11:06:05AM

Note: Sampler Please return this paper with your samples

Kit #: 289949



Client ID: MERIDIAN-ID



Project Code: SPECIAL Bottle Orders

Created By: Vanessa Berry - [ZIA8]

Deliver By: 05/12/2021

STG: Bottle Orders

Ice Type: W

Group Name: Pilot Study

PO#/JOB#:

Description: No Schedule

Ship Sample Kits to
City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300

Attn: Jason Smith
Phone: 208-519-0003

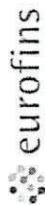
Send Report to
City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300

Attn: Jason Smith
Phone: 208-519-0003

Billing Address
City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300

Attn: Dennis Teller
Phone: 1-208-985-1200

# of Sample Tests	Bottle Qty - Type [preservative Information]	Total	UN DOT #
20 Ammonia Nitrogen	1 - 250ml poly [0.5 ml H2SO4 (50%)]	20	UN1830
20 Iron Total ICAP, Manganese Total ICAP	1 - 500ml acid poly [2ml HNO3 (18%)]	20	UN2031
Sum Tests: 40		Sum Bottles: 40	
Comments			
include return shipping labels			
COC			



Eaton Analytical

750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629
Phone: 626 386 1100
Fax: 626 386 1101
800 566 LABS (800 566 5227)
Website: www.EatonAnalytical.com

CHAIN OF CUSTODY RECORD

EUROFINS EATON ANALYTICAL USE ONLY:

LOGIN COMMENTS:

SAMPLE TEMP RECEIVED AT:

☐ (Other) IR Gun ID = _____ (Observation = _____ °C) (check for yes)

☒ Monrovia IR Gun ID = 6514 (Observation = 0.6 °C) (Final = 0.3 °C)

Compliance Acceptance Criteria: (Chemistry: 4 ± 2 °C) (Microbiology: < 10 °C)

TYPE OF ICE: Real ☒ Synthetic ☐ No Ice ☐ CONDITION OF ICE: Frozen ☒ Partially Frozen ☐ Thawed ☐ N/A ☐

METHOD OF SHIPMENT: Pick-Up / Walk-In / FedEx / UPS / DHL / Area Fast / Top Line / Other: _____

TO BE COMPLETED BY SAMPLER:

COMPANY/AGENCY NAME: City of Monrovia Water Division

PROJECT CODE: 289949

EEA CLIENT CODE: Monrovia-FD

COC ID: _____

SAMPLE GROUP: Well #26 2 of 2

TAT requested: rush by adv notice only

STD 1 wk 3 day 2 day 1 day

SAMPLE DATE	SAMPLE TIME	SAMPLE ID	CLIENT LAB ID	MATRIX	FIELD DATA	FIELD DATA
6/21	1200	WEL26 F2		CFW		
6/21	1500	WEL26 F1		CFW		
6/21	1500	WEL26 F2		CFW		
6/21	0845	WEL26 RAW		RGL		
6/21	0845	WEL26 F1		CFW		
6/21	0845	WEL26 F2		CFW		
6/21	1215	WEL26 F1		CFW		
6/21	1215	WEL26 F2		CFW		
6/21	1500	WEL26 F1		CFW		
6/21	1500	WEL26 F2		CFW		

* MATRIX TYPES: RSW = Raw Surface Water
RGW = Raw Ground Water

SIGNATURE

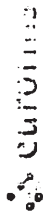
PRINT NAME

COMPANY/TITLE

DATE

TIME

SAMPLED BY: <u>[Signature]</u>	WAT/CLP/PRST	6/10/21	1500
RELINQUISHED BY: <u>[Signature]</u>	City of Monrovia / Water Division	6/15/21	1430
RECEIVED BY: _____			
RELINQUISHED BY: _____			
RECEIVED BY: _____			



Kit Order for City of Meridian

Eaton Analytical

Vanessa Berry is your Eurofins Eaton Analytical, LLC Service Manager

750 Royal Oaks Drive, Suite 100
Monrovia, California 91016-3629
(626) 386-1100 FAX (866) 988-3757

Created Date & Time: 5/3/2021 11:06:05AM

Note: Sampler Please return this paper with your samples

Kit #: 289949



Created By: Vanessa Berry - (ZIA8)

Deliver By: 05/12/2021

STG: Bottle Orders

Ice Type: W

Client ID: MERIDIAN-ID



Project Code: SPECIAL Bottle Orders

Group Name: Pilot Study

PO#/JOB#:

Description: No Schedule

Ship Sample Kits to
City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300

Attn: Jason Smith
Phone: 208-519-0003

Send Report to
City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300

Attn: Jason Smith
Phone: 208-519-0003

Billing Address
City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300

Attn: Dennis Teller
Phone: 1-208-985-1200

# of Sample Tests	Bottle Qty - Type [preservative Information]	Total	UN DOT #
20 Ammonia Nitrogen	1 - 250ml poly [0.5 ml H2SO4 (50%)]	20	UN1830
20 Iron Total ICAP, Manganese Total ICAP	1 - 500ml acid poly [2ml HNO3 (18%)]	20	UN2031
Sum Tests: 40		Sum Bottles: 40	
Comments			
Include return shipping labels			
COC			

Code Status Date Shipped Via Tracking # # of Coolers Prepared By

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Comments

Report: 941321
Project: SPECIAL
Group: Pilot Study

City of Meridian
Jason Smith
2235 NW 8th Street
Meridian, ID 83642-2300

Flags Legend:

M2 - Matrix spike recovery was low; the associated blank spike recovery was acceptable.

R4 - MS/MSD RPD exceeded the method acceptance limit. Recovery met acceptance criteria.

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Report: 941321
Project: SPECIAL
Group: Pilot Study

City of Meridian
Jason Smith
2235 NW 8th Street
Meridian, ID 83642-2300

Samples Received on:
06/16/2021 1319

Analyzed	Analyte	Sample ID	Result	Federal MCL	Units	MRL
202106170101 <u>Well 26 RAW</u>						
06/24/2021 12:22	Ammonia Nitrogen		0.060		mg/L	0.050
06/21/2021 13:49	Iron Total ICAP		0.36	0.3	mg/L	0.010
06/21/2021 13:49	Manganese Total ICAP		0.060	0.05	mg/L	0.0020
202106170102 <u>Well 26 F1</u>						
06/21/2021 13:50	Iron Total ICAP		0.027	0.3	mg/L	0.010
06/21/2021 13:50	Manganese Total ICAP		0.0039	0.05	mg/L	0.0020
202106170103 <u>Well 26 F2</u>						
06/21/2021 13:53	Iron Total ICAP		0.032	0.3	mg/L	0.010
06/21/2021 13:53	Manganese Total ICAP		0.0031	0.05	mg/L	0.0020
202106170104 <u>Well 26 F1</u>						
06/21/2021 13:54	Iron Total ICAP		0.011	0.3	mg/L	0.010
202106170105 <u>Well 26 F2</u>						
06/21/2021 13:55	Iron Total ICAP		0.015	0.3	mg/L	0.010
06/21/2021 13:55	Manganese Total ICAP		0.0025	0.05	mg/L	0.0020
202106170107 <u>Well 26 F2</u>						
06/21/2021 13:57	Iron Total ICAP		0.012	0.3	mg/L	0.010
06/21/2021 13:57	Manganese Total ICAP		0.0021	0.05	mg/L	0.0020
202106170581 <u>Well 26 RAW</u>						
06/24/2021 13:32	Ammonia Nitrogen		0.061		mg/L	0.050
06/21/2021 14:13	Iron Total ICAP		0.25	0.3	mg/L	0.010
06/21/2021 14:13	Manganese Total ICAP		0.058	0.05	mg/L	0.0020
202106170582 <u>Well 26 F1</u>						
06/21/2021 14:07	Iron Total ICAP		0.034	0.3	mg/L	0.010
06/21/2021 14:07	Manganese Total ICAP		0.0059	0.05	mg/L	0.0020
202106170583 <u>Well 26 F2</u>						
06/21/2021 14:08	Iron Total ICAP		0.033	0.3	mg/L	0.010
06/21/2021 14:08	Manganese Total ICAP		0.0049	0.05	mg/L	0.0020
202106170584 <u>Well 26 F1</u>						
06/21/2021 14:09	Iron Total ICAP		0.018	0.3	mg/L	0.010
06/21/2021 14:09	Manganese Total ICAP		0.0033	0.05	mg/L	0.0020
202106170585 <u>Well 26 F2</u>						
06/21/2021 14:10	Iron Total ICAP		0.021	0.3	mg/L	0.010

SUMMARY OF POSITIVE DATA ONLY

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Report: 941321
Project: SPECIAL
Group: Pilot Study

City of Meridian
Jason Smith
2235 NW 8th Street
Meridian, ID 83642-2300

Samples Received on:
06/16/2021 1319

Analyzed	Analyte	Sample ID	Result	Federal MCL	Units	MRL
06/21/2021 14:10	Manganese Total ICAP		0.0038	0.05	mg/L	0.0020
	202106170586	<u>Well 26 F1</u>				
06/21/2021 14:11	Iron Total ICAP		0.012	0.3	mg/L	0.010
06/21/2021 14:11	Manganese Total ICAP		0.0027	0.05	mg/L	0.0020
	202106170587	<u>Well 26 F2</u>				
06/21/2021 14:12	Iron Total ICAP		0.016	0.3	mg/L	0.010
06/21/2021 14:12	Manganese Total ICAP		0.0029	0.05	mg/L	0.0020
	202106170588	<u>Well 26 F1</u>				
06/21/2021 13:58	Iron Total ICAP		0.031	0.3	mg/L	0.010
06/21/2021 13:58	Manganese Total ICAP		0.0037	0.05	mg/L	0.0020
	202106170589	<u>Well 26 F2</u>				
06/21/2021 13:59	Iron Total ICAP		0.036	0.3	mg/L	0.010
06/21/2021 13:59	Manganese Total ICAP		0.0052	0.05	mg/L	0.0020
	202106170590	<u>Well 26 F1</u>				
06/21/2021 14:00	Iron Total ICAP		0.013	0.3	mg/L	0.010
06/21/2021 14:00	Manganese Total ICAP		0.0023	0.05	mg/L	0.0020
	202106170591	<u>Well 26 F2</u>				
06/21/2021 14:05	Iron Total ICAP		0.019	0.3	mg/L	0.010
06/21/2021 14:05	Manganese Total ICAP		0.0024	0.05	mg/L	0.0020
	202106170592	<u>Well 26 F2</u>				
06/21/2021 14:06	Iron Total ICAP		0.014	0.3	mg/L	0.010
06/21/2021 14:06	Manganese Total ICAP		0.0022	0.05	mg/L	0.0020

SUMMARY OF POSITIVE DATA ONLY

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Data

Report: 941321
Project: SPECIAL
Group: Pilot Study

City of Meridian
Jason Smith
2235 NW 8th Street
Meridian, ID 83642-2300

Samples Received on:
06/16/2021 1319

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
Well 26 F1 (202106170100)						Sampled on 06/09/2021 1500			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:46	1335663	1336111	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:46	1335663	1336111	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:19		1337362	(EPA 350.1)	Ammonia Nitrogen	ND (M2,R4)	mg/L	0.050	1
Well 26 RAW (202106170101)						Sampled on 06/10/2021 0845			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:49	1335663	1336111	(EPA 200.7)	Iron Total ICAP	0.36	mg/L	0.010	1
06/17/21	06/21/21 13:49	1335663	1336111	(EPA 200.7)	Manganese Total ICAP	0.060	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:22		1337362	(EPA 350.1)	Ammonia Nitrogen	0.060	mg/L	0.050	1
Well 26 F1 (202106170102)						Sampled on 06/10/2021 0845			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:50	1335663	1336111	(EPA 200.7)	Iron Total ICAP	0.027	mg/L	0.010	1
06/17/21	06/21/21 13:50	1335663	1336111	(EPA 200.7)	Manganese Total ICAP	0.0039	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:57		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F2 (202106170103)						Sampled on 06/10/2021 0845			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:53	1335663	1336111	(EPA 200.7)	Iron Total ICAP	0.032	mg/L	0.010	1
06/17/21	06/21/21 13:53	1335663	1336111	(EPA 200.7)	Manganese Total ICAP	0.0031	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:58		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F1 (202106170104)						Sampled on 06/10/2021 1215			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:54	1335663	1336111	(EPA 200.7)	Iron Total ICAP	0.011	mg/L	0.010	1
06/17/21	06/21/21 13:54	1335663	1336111	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:24		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F2 (202106170105)						Sampled on 06/10/2021 1215			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:55	1335663	1336111	(EPA 200.7)	Iron Total ICAP	0.015	mg/L	0.010	1

Rounding on totals after summation.

(c) - indicates calculated results. Analysis is a calculated result. Reported results are not rounded until the final step before reporting. Therefore methods that use a test result with further calculation may have slight differences in final result than the component analyses.

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Data

Report: 941321
Project: SPECIAL
Group: Pilot Study

City of Meridian
Jason Smith
2235 NW 8th Street
Meridian, ID 83642-2300

Samples Received on:
06/16/2021 1319

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
06/17/21	06/21/21 13:55	1335663	1336111	(EPA 200.7)	Manganese Total ICAP	0.0025	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:25		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F1 (202106170106)						Sampled on 06/10/2021 1500			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:56	1335663	1336111	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:56	1335663	1336111	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:26		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F2 (202106170107)						Sampled on 06/10/2021 1500			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:57	1335663	1336111	(EPA 200.7)	Iron Total ICAP	0.012	mg/L	0.010	1
06/17/21	06/21/21 13:57	1335663	1336111	(EPA 200.7)	Manganese Total ICAP	0.0021	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:27		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 RAW (202106170581)						Sampled on 06/08/2021 0830			
EPA 200.7 - ICP Metals									
06/18/21	06/21/21 14:13	1335731	1336111	(EPA 200.7)	Iron Total ICAP	0.25	mg/L	0.010	1
06/18/21	06/21/21 14:13	1335731	1336111	(EPA 200.7)	Manganese Total ICAP	0.058	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:32		1337104	(EPA 350.1)	Ammonia Nitrogen	0.061	mg/L	0.050	1
Well 26 F1 (202106170582)						Sampled on 06/08/2021 0830			
EPA 200.7 - ICP Metals									
06/18/21	06/21/21 14:07	1335731	1336111	(EPA 200.7)	Iron Total ICAP	0.034	mg/L	0.010	1
06/18/21	06/21/21 14:07	1335731	1336111	(EPA 200.7)	Manganese Total ICAP	0.0059	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:35		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F2 (202106170583)						Sampled on 06/08/2021 0830			
EPA 200.7 - ICP Metals									
06/18/21	06/21/21 14:08	1335731	1336111	(EPA 200.7)	Iron Total ICAP	0.033	mg/L	0.010	1
06/18/21	06/21/21 14:08	1335731	1336111	(EPA 200.7)	Manganese Total ICAP	0.0049	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:36		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F1 (202106170584)						Sampled on 06/08/2021 1200			

Rounding on totals after summation.

(c) - indicates calculated results. Analysis is a calculated result. Reported results are not rounded until the final step before reporting. Therefore methods that use a test result with further calculation may have slight differences in final result than the component analyses.

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Data

Report: 941321
Project: SPECIAL
Group: Pilot Study

City of Meridian
Jason Smith
2235 NW 8th Street
Meridian, ID 83642-2300

Samples Received on:
06/16/2021 1319

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
EPA 200.7 - ICP Metals									
06/18/21	06/21/21 14:09	1335731	1336111	(EPA 200.7)	Iron Total ICAP	0.018	mg/L	0.010	1
06/18/21	06/21/21 14:09	1335731	1336111	(EPA 200.7)	Manganese Total ICAP	0.0033	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:37		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F2 (202106170585)						Sampled on 06/08/2021 1200			
EPA 200.7 - ICP Metals									
06/18/21	06/21/21 14:10	1335731	1336111	(EPA 200.7)	Iron Total ICAP	0.021	mg/L	0.010	1
06/18/21	06/21/21 14:10	1335731	1336111	(EPA 200.7)	Manganese Total ICAP	0.0038	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:39		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F1 (202106170586)						Sampled on 06/08/2021 1500			
EPA 200.7 - ICP Metals									
06/18/21	06/21/21 14:11	1335731	1336111	(EPA 200.7)	Iron Total ICAP	0.012	mg/L	0.010	1
06/18/21	06/21/21 14:11	1335731	1336111	(EPA 200.7)	Manganese Total ICAP	0.0027	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:40		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F2 (202106170587)						Sampled on 06/08/2021 1500			
EPA 200.7 - ICP Metals									
06/18/21	06/21/21 14:12	1335731	1336111	(EPA 200.7)	Iron Total ICAP	0.016	mg/L	0.010	1
06/18/21	06/21/21 14:12	1335731	1336111	(EPA 200.7)	Manganese Total ICAP	0.0029	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:43		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F1 (202106170588)						Sampled on 06/09/2021 0830			
EPA 200.7 - ICP Metals									
06/18/21	06/21/21 13:58	1335731	1336111	(EPA 200.7)	Iron Total ICAP	0.031	mg/L	0.010	1
06/18/21	06/21/21 13:58	1335731	1336111	(EPA 200.7)	Manganese Total ICAP	0.0037	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:44		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F2 (202106170589)						Sampled on 06/09/2021 0830			
EPA 200.7 - ICP Metals									
06/18/21	06/21/21 13:59	1335731	1336111	(EPA 200.7)	Iron Total ICAP	0.036	mg/L	0.010	1
06/18/21	06/21/21 13:59	1335731	1336111	(EPA 200.7)	Manganese Total ICAP	0.0052	mg/L	0.0020	1

Rounding on totals after summation.
(c) - indicates calculated results. Analysis is a calculated result. Reported results are not rounded until the final step before reporting. Therefore methods that use a test result with further calculation may have slight differences in final result than the component analyses.

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Data

Report: 941321
Project: SPECIAL
Group: Pilot Study

City of Meridian
Jason Smith
2235 NW 8th Street
Meridian, ID 83642-2300

Samples Received on:
06/16/2021 1319

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:46		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F1 (202106170590)						Sampled on 06/09/2021 1200			
EPA 200.7 - ICP Metals									
06/18/21	06/21/21 14:00	1335731	1336111	(EPA 200.7)	Iron Total ICAP	0.013	mg/L	0.010	1
06/18/21	06/21/21 14:00	1335731	1336111	(EPA 200.7)	Manganese Total ICAP	0.0023	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:47		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 26 F2 (202106170591)						Sampled on 06/09/2021 1200			
EPA 200.7 - ICP Metals									
06/18/21	06/21/21 14:05	1335731	1336111	(EPA 200.7)	Iron Total ICAP	0.019	mg/L	0.010	1
06/18/21	06/21/21 14:05	1335731	1336111	(EPA 200.7)	Manganese Total ICAP	0.0024	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:53		1337104	(EPA 350.1)	Ammonia Nitrogen	ND (M2)	mg/L	0.050	1
Well 26 F2 (202106170592)						Sampled on 06/09/2021 1500			
EPA 200.7 - ICP Metals									
06/18/21	06/21/21 14:06	1335731	1336111	(EPA 200.7)	Iron Total ICAP	0.014	mg/L	0.010	1
06/18/21	06/21/21 14:06	1335731	1336111	(EPA 200.7)	Manganese Total ICAP	0.0022	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 13:56		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1

Rounding on totals after summation.

(c) - indicates calculated results. Analysis is a calculated result. Reported results are not rounded until the final step before reporting. Therefore methods that use a test result with further calculation may have slight differences in final result than the component analyses.

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Report: 941321
Project: SPECIAL
Group: Pilot Study

City of Meridian

ICP Metals

Prep Batch: 1335663 Analytical Batch: 1336111

Analysis Date: 06/21/2021

202106170100	Well 26 F1
202106170101	Well 26 RAW
202106170102	Well 26 F1
202106170103	Well 26 F2
202106170104	Well 26 F1
202106170105	Well 26 F2
202106170106	Well 26 F1
202106170107	Well 26 F2
202106170581	Well 26 RAW
202106170582	Well 26 F1
202106170583	Well 26 F2
202106170584	Well 26 F1
202106170585	Well 26 F2
202106170586	Well 26 F1
202106170587	Well 26 F2
202106170588	Well 26 F1
202106170589	Well 26 F2
202106170590	Well 26 F1
202106170591	Well 26 F2
202106170592	Well 26 F2

[illegible]

Ammonia Nitrogen

Analytical Batch: 1337104

Analysis Date: 06/24/2021

202106170102	Well 26 F1
202106170103	Well 26 F2
202106170581	Well 26 RAW
202106170582	Well 26 F1
202106170583	Well 26 F2
202106170584	Well 26 F1
202106170585	Well 26 F2
202106170586	Well 26 F1
202106170587	Well 26 F2
202106170588	Well 26 F1
202106170589	Well 26 F2
202106170590	Well 26 F1
202106170591	Well 26 F2
202106170592	Well 26 F2

[illegible]

Ammonia Nitrogen

Analytical Batch: 1337362

Analysis Date: 06/24/2021

202106170100	Well 26 F1
202106170101	Well 26 RAW
202106170104	Well 26 F1
202106170105	Well 26 F2
202106170106	Well 26 F1

Analyzed by: MIA8
Analyzed by: MIA8
Analyzed by: MIA8
Analyzed by: MIA8
Analyzed by: MIA8

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory QC Summary

Report: 941321
Project: SPECIAL
Group: Pilot Study

City of Meridian

202106170107

Well 26 F2

Analyzed by: MIA8

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Report: 941321
Project: SPECIAL
Group: Pilot Study

City of Meridian

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield(%)	Limits (%)	RPD Limit(%)	RPD%
ICP Metals by EPA 200.7									
Analytical Batch: 1336111					Analysis Date: 06/21/2021				
LCS1	Iron Total ICAP		5	5.16	mg/L	103	(85-115)		
LCS2	Iron Total ICAP		5	5.16	mg/L	103	(85-115)	20	0.0
MBLK	Iron Total ICAP			<0.004850	mg/L				
MRL_CHK	Iron Total ICAP		0.01	0.0103	mg/L	103	(50-150)		
MS_202106170100	Iron Total ICAP	ND	5	5.22	mg/L	104	(70-130)		
MS2_202106170590	Iron Total ICAP	0.013	5	5.15	mg/L	103	(70-130)		
MSD_202106170100	Iron Total ICAP	ND	5	5.20	mg/L	104	(70-130)	20	0.35
MSD2_202106170590	Iron Total ICAP	0.013	5	5.21	mg/L	104	(70-130)	20	1.2
LCS1	Manganese Total ICAP		2	2.05	mg/L	103	(85-115)		
LCS2	Manganese Total ICAP		2	2.04	mg/L	102	(85-115)	20	0.0
MBLK	Manganese Total ICAP			<0.000700	mg/L				
MRL_CHK	Manganese Total ICAP		0.002	0.00219	mg/L	110	(50-150)		
MS_202106170100	Manganese Total ICAP	ND	2	2.07	mg/L	103	(70-130)		
MS2_202106170590	Manganese Total ICAP	0.0023	2	2.04	mg/L	102	(70-130)		
MSD_202106170100	Manganese Total ICAP	ND	2	2.05	mg/L	103	(70-130)	20	1.0
MSD2_202106170590	Manganese Total ICAP	0.0023	2	2.06	mg/L	103	(70-130)	20	1.0
Ammonia Nitrogen by EPA 350.1									
Analytical Batch: 1337104					Analysis Date: 06/24/2021				
LCS3	Ammonia Nitrogen		1	0.992	mg/L	99	(90-110)		
LCS4	Ammonia Nitrogen		1	1.01	mg/L	101	(90-110)	20	1.8
MBLK	Ammonia Nitrogen			<0.00674	mg/L				
MRL_CHK	Ammonia Nitrogen		0.05	0.0530	mg/L	106	(79-126)		
MS1_202106170581	Ammonia Nitrogen	0.061	1	1.15	mg/L	109	(90-110)		
MS1_202106170591	Ammonia Nitrogen	ND	1	0.682	mg/L	<u>68</u>	(90-110)		
MSD1_202106170581	Ammonia Nitrogen	0.061	1	1.13	mg/L	107	(90-110)	20	1.8
MSD1_202106170591	Ammonia Nitrogen	ND	1	0.736	mg/L	<u>73</u>	(90-110)	20	7.6
Ammonia Nitrogen by EPA 350.1									
Analytical Batch: 1337362					Analysis Date: 06/24/2021				
LCS3	Ammonia Nitrogen		1	0.981	mg/L	98	(90-110)		
LCS4	Ammonia Nitrogen		1	0.993	mg/L	99	(90-110)	20	1.2
MBLK	Ammonia Nitrogen			<0.00674	mg/L				
MRL_CHK	Ammonia Nitrogen		0.05	0.0510	mg/L	102	(79-126)		
MS1_202106170089	Ammonia Nitrogen	ND	1	0.834	mg/L	<u>82</u>	(90-110)		
MS1_202106170100	Ammonia Nitrogen	ND	1	1.02	mg/L	102	(90-110)		

Spike recovery is already corrected for native results.

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.

Criteria for MS and Dup are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

RPD not calculated for LCS2 when different a concentration than LCS1 is used.

RPD not calculated for Duplicates when the result is not five times the MRL (Minimum Reporting Level).

(S) - Indicates surrogate compound.

(I) - Indicates internal standard compound.

Tel: (626) 386-1100
Fax: (626) 988-3757
1 800 566 LABS (1 800 566 5227)

Report: 941321
Project: SPECIAL
Group: Pilot Study

City of Meridian

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield(%)	Limits (%)	RPD Limit(%)	RPD%
MSD1_202106170089	Ammonia Nitrogen	ND	1	0.584	mg/L	<u>57</u>	(90-110)	20	<u>35</u>
MSD1_202106170100	Ammonia Nitrogen	ND	1	0.716	mg/L	<u>71</u>	(90-110)	20	<u>35</u>

Spike recovery is already corrected for native results.

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.

Criteria for MS and Dup are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

RPD not calculated for LCS2 when different a concentration than LCS1 is used.

RPD not calculated for Duplicates when the result is not five times the MRL (Minimum Reporting Level).

(S) - Indicates surrogate compound.

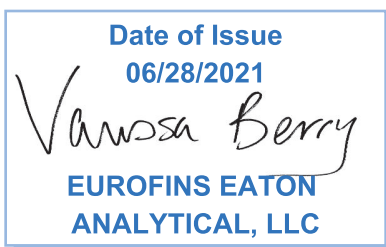
(I) - Indicates internal standard compound.

750 Royal Oaks Drive, Suite 100
Monrovia, California 91016-3629
Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Report

for

City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300
Attention: Jason Smith



Utah ELCP CA00006

ZIA8: Vanessa Berry
Project Manager

Report: 941320
Project: SPECIAL
Group: Pilot Study

* Accredited in accordance with TNI 2016 and ISO/IEC 17025:2017.

* Laboratory certifies that the test results meet all **TNI 2016 and ISO/IEC 17025:2017** requirements unless noted under the individual analysis.

* Following the cover page are State Certification List, ISO 17025 Accredited Method List, Acknowledgement of Samples Received, Comments, Hits Report, Data Report, QC Summary, QC Report and Regulatory Forms, as applicable.

* Test results relate only to the sample(s) tested.

* Test results apply to the sample(s) as received, unless otherwise noted in the comments report (ISO/IEC 17025:2017).

* This report shall not be reproduced except in full, without the written approval of the laboratory.

* This report includes ISO/IEC 17025 and non-ISO 17025 accredited methods.

STATE CERTIFICATION LIST

State	Certification Number	State	Certification Number
Alabama	41060	Montana	Cert 0035
Arizona	AZ0778	Nebraska	Certified
Arkansas	Certified	Nevada	CA000062018
California	2813	New Hampshire *	2959
Colorado	Certified	New Jersey *	CA 008
Connecticut	PH-0107	New Mexico	Certified
Delaware	CA 006	New York *	11320
Florida *	E871024	North Carolina	06701
Georgia	947	North Dakota	R-009
Guam	18-005R	Oregon *	CA200003-005
Hawaii	Certified	Pennsylvania *	68-565
Idaho	Certified	Puerto Rico	Certified
Illinois *	200033	Rhode Island	LAO00326
Indiana	C-CA-01	South Carolina	87016
Iowa - Asbestos	413	South Dakota	Certified
Kansas *	E-10268	Tennessee	TN02839
Kentucky	90107	Texas *	T104704230-18-15
Louisiana *	LA180000	Utah (Primary AB) *	CA00006
Maine	CA0006	Vermont	VT0114
Maryland	224	Virginia *	460260
Commonwealth of Northern Marianas Is.	MP0004	Washington	C838
Massachusetts	M-CA006	EPA Region 5	Certified
Michigan	9906	Los Angeles County Sanitation Districts	10264
Mississippi	Certified		

* NELAP/TNI Recognized Accreditation Bodies

ISO/IEC 17025 Accredited Method List

The tests listed below are accredited and meet the requirements of ISO/IEC 17025 as verified by the ANSI-ASQ National Accreditation Board/A2LA.
Refer to Certificate and scope of accreditation (5890) found at: <https://www.eurofinsus.com/Eaton>

SPECIFIC TESTS	METHOD OR TECHNIQUE USED	Environ-mental (Drinking Water)	Environ-mental (Waste Water)	Water as a Component of Food and Bev/Bev/ Bottled Water
1,2,3-TCP (5 PPT & 0.5 PPT)	CA SRL 524M-TCP	x		x
1,4-Dioxane	EPA 522	x		x
2,3,7,8-TCDD	Modified EPA 1613B	x		x
Acrylamide	In House Method (2440)	x		x
Algal Toxins/Microcystin	In House Method (3570)			
Alkalinity	SM 2320B	x	x	x
Ammonia	EPA 350.1		x	x
Ammonia	SM 4500-NH3 H		x	x
Anions and DBPs by IC	EPA 300.0	x	x	x
Anions and DBPs by IC	EPA 300.1	x		x
Asbestos	EPA 100.2	x	x	
BOD / CBOD	SM 5210B		x	x
Bromate	In House Method (2447)	x		x
Carbamates	EPA 531.2	x		x
Carbonate as CO3	SM 2330B	x	x	x
Carbonyls	EPA 556	x		x
COD	EPA 410.4 / SM 5220D		x	
Chloramines	SM 4500-CL G	x	x	x
Chlorinated Acids	EPA 515.4	x		x
Chlorinated Acids	EPA 555	x		x
Chlorine Dioxide	SM 4500-CLO2 D Palin Test	x		x
Chlorine -Total/Free/ Combined Residual	SM 4500-Cl G	x	x	x
Conductivity	EPA 120.1		x	
Conductivity	SM 2510B	x	x	x
Corrosivity (Langelier Index)	SM 2330B	x		x
Cyanide, Amenable	SM 4500-CN G	x	x	
Cyanide, Free	SM 4500CN F	x	x	x
Cyanide, Total	EPA 335.4	x	x	x
Cyanogen Chloride (screen)	In House Method (2470)	x		x
Diquat and Paraquat	EPA 549.2	x		x
DBP/HAA	SM 6251B	x		x
Dissolved Oxygen	SM 4500-O G		x	x
DOC	SM 5310C	x		x
E. Coli (MTF/EC+MUG)		x		x
E. Coli (CFR 141.21(f)(6)(i))		x		x
E. Coli	SM 9223		x	
E. Coli (Enumeration)	SM 9221B.1/ SM 9221F	x		x
E. Coli (Enumeration)	SM 9223B	x		x
EDB/DCBP	EPA 504.1	x		
EDB/DBCP and DBP	EPA 551.1	x		x
EDTA and NTA	In House Method (2454)	x		x
Endothall	EPA 548.1	x		x
Endothall	In-house Method (2445)	x		x
Enterococci	SM 9230B	x	x	
Fecal Coliform	SM 9221 E (MTF/EC)	x		
Fecal Coliform	SM 9221C, E (MTF/EC)		x	
Fecal Coliform (Enumeration)	SM 9221E (MTF/EC)	x		x
Fecal Coliform with Chlorine Present	SM 9221E		x	
Fecal Streptococci	SM 9230B	x	x	
Fluoride	SM 4500-F C	x	x	x
Glyphosate	EPA 547	x		x
Glyphosate + AMPA	In House Method (3618)	x		x
Gross Alpha/Beta	EPA 900.0	x	x	x
Gross Alpha Coprecipitation	SM 7110 C	x	x	x
Hardness	SM 2340B	x	x	x
Heterotrophic Bacteria	In House Method (2439)	x		x
Heterotrophic Bacteria	SM 9215 B	x		x
Hexavalent Chromium	EPA 218.6	x	x	x

SPECIFIC TESTS	METHOD OR TECHNIQUE USED	Environ-mental (Drinking Water)	Environ-mental (Waste Water)	Water as a Component of Food and Bev/Bev/ Bottled Water
Hexavalent Chromium	EPA 218.7	x		x
Hexavalent Chromium	SM 3500-Cr B		x	
Hormones	EPA 539	x		x
Hydroxide as OH Calc.	SM 2330B	x		x
Kjeldahl Nitrogen	EPA 351.2		x	
Legionella	Legiolert	x		x
Mercury	EPA 200.8	x		x
Metals	EPA 200.7 / 200.8	x	x	x
Microcystin LR	ELISA (2360)	x		x
Microcystin, Total	EPA 546	x		x
NDMA	EEA/Agilent 521.1 In house method (2425)	x		x
Nitrate/Nitrite Nitrogen	EPA 353.2	x	x	x
OCL, Pesticides/PCB	EPA 505	x		x
Ortho Phosphate	EPA 365.1	x	x	x
Ortho Phosphorous	SM 4500P E	x		x
Oxyhalides Disinfection Byproducts	EPA 317.0	x		x
Perchlorate	EPA 331.0	x		x
Perchlorate (low and high)	EPA 314.0	x		x
Perfluorinated Alkyl Acids	EPA 537	x		x
Perfluorinated Pollutant	In house Method (2434)	x		x
pH	EPA 150.1	x		
pH	SM 4500-H+B	x	x	x
Phenylurea Pesticides/ Herbicides	In House Method, based on EPA 532 (2448)	x		x
Pseudomonas	IDEXX Pseudalart (2461)	x		x
Radium-226	GA Institute of Tech	x		x
Radium-228	GA Institute of Tech	x		x
Radon-222	SM 7500RN	x		x
Residue, Filterable	SM 2540C	x	x	x
Residue, Non-filterable	SM 2540D		x	
Residue, Total	SM 2540B		x	x
Residue, Volatile	EPA 160.4		x	
Semi-VOC	EPA 525.2	x		x
Silica	SM 4500-Si D	x	x	
Silica	SM 4500-SiO2 C	x	x	
Sulfide	SM 4500-S ⁻ D		x	
Sulfite	SM 4500-SO ³ B	x	x	x
Surfactants	SM 5540C	x	x	x
Taste and Odor Analytes	SM 6040E	x		x
Total Coliform (P/A)	SM 9221 A, B	x		x
Total Coliform (Enumeration)	SM 9221 A, B, C	x		x
Total Coliform / E. coli	Colisure SM 9223	x		x
Total Coliform	SM 9221B		x	
Total Coliform with Chlorine Present	SM 9221B		x	
Total Coliform / E.coli (P/A and Enumeration)	SM 9223	x		x
TOC	SM 5310C	x	x	x
TOX	SM 5320B		x	
Total Phenols	EPA 420.1		x	
Total Phenols	EPA 420.4	x	x	x
Total Phosphorous	SM 4500 P E		x	
Triazine Pesticides & Degradates	In House (3617)	x		x
Turbidity	EPA 180.1	x	x	x
Turbidity	SM 2130B	x	x	
Uranium by ICP/MS	EPA 200.8	x		x
UV 254	SM 5910B	x		
VOC	EPA 524.2	x		x
VOC	In House Method (2411)	x		x
Yeast and Mold	SM 9610	x		x
Field Sampling	N/A			

Acknowledgement of Samples Received

Addr: **City of Meridian**
2235 NW 8th Street
Meridian, ID 83642-2300

Client ID: MERIDIAN-ID
Folder #: 941320
Project: SPECIAL
Sample Group: Pilot Study

Attn: Jason Smith
Phone: 208-519-0003

Project Manager: Vanessa Berry
Phone: 503-310-3905

The following samples were received from you on **June 16, 2021 at 1314**. They have been scheduled for the tests listed below each sample. If this information is incorrect, please contact your service representative. Thank you for using Eurofins Eaton Analytical, LLC.

Sample #	Sample ID	Sample Date
<u>202106170080</u>	Well 24 RAW	06/12/2021 0900
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170081</u>	Well 24 F1	06/12/2021 0900
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170082</u>	Well 24 F2	06/12/2021 0900
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170083</u>	Well 24 F1	06/12/2021 1200
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170084</u>	Well 24 F2	06/12/2021 1200
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170085</u>	Well 24 F1	06/12/2021 1500
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170086</u>	Well 24 F2	06/12/2021 1500
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170087</u>	Well 24 F1	06/13/2021 0845
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170088</u>	Well 24 F2	06/13/2021 0845
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170089</u>	Well 24 F1	06/13/2021 1200
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170090</u>	Well 24 F2	06/13/2021 1200
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170091</u>	Well 24 F1	06/13/2021 1500
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	
<u>202106170092</u>	Well 24 F2	06/13/2021 1500
	Ammonia Nitrogen Iron Total ICAP Manganese Total ICAP	

Acknowledgement of Samples Received

Addr: **City of Meridian**
2235 NW 8th Street
Meridian, ID 83642-2300

Client ID: MERIDIAN-ID
Folder #: 941320
Project: SPECIAL
Sample Group: Pilot Study

Attn: Jason Smith
Phone: 208-519-0003

Project Manager: Vanessa Berry
Phone: 503-310-3905

The following samples were received from you on **June 16, 2021 at 1314**. They have been scheduled for the tests listed below each sample. If this information is incorrect, please contact your service representative. Thank you for using Eurofins Eaton Analytical, LLC.

Sample #	Sample ID	Sample Date
<u>202106170093</u>	Well 24 F1	06/14/2021 0800
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP
<u>202106170094</u>	Well 24 F2	06/14/2021 0800
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP
<u>202106170095</u>	Well 24 RAW	06/14/2021 1100
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP
<u>202106170096</u>	Well 24 F1	06/14/2021 1100
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP
<u>202106170097</u>	Well 24 F2	06/14/2021 1100
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP
<u>202106170098</u>	Well 24 F1	06/14/2021 1400
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP
<u>202106170099</u>	Well 24 F2	06/14/2021 1400
	Ammonia Nitrogen	Iron Total ICAP
		Manganese Total ICAP

Test Description



Eaton Analytical

CHAIN OF CUSTODY RECORD

EUROFINS EATON ANALYTICAL USE ONLY:

750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629
Phone: 626 386 1100
Fax: 626 386 1101
800 566 LABS (800 566 5227)
Website: www.EatonAnalytical.com

LOGIN COMMENTS:

SAMPLES CHECKED AGAINST COC BY:

1/12

SAMPLE TEMP RECEIVED AT:

(Other) IR Gun ID =

(Observation =

°C) (Corr. Factor

°C) (Final =

°C) (check for yes)

Monrovia

IR Gun ID =

(Observation =

°C) (Corr. Factor

°C) (Final =

°C) (check for yes)

Compliance Acceptance Criteria: (Chemistry: 4 ± 2 °C) (Microbiology: < 10 °C)

TYPE OF ICE: Real

Synthetic

No Ice

CONDITION OF ICE: Frozen

Partially Frozen

Thawed

N/A

METHOD OF SHIPMENT: Pick-Up / Walk-In / FedEx / UPS / DHL / Area Fast / Top Line / Other:

TO BE COMPLETED BY SAMPLER:

506209015497

(check for yes)

(check for yes)

COMPANY/AGENCY NAME:		PROJECT CODE:	COMPLIANCE SAMPLES		NON-COMPLIANCE SAMPLES	
City of Mendocino Water Division		289950	- Requires state forms		REGULATION INVOLVED: SDWA	
EEA CLIENT CODE:	COC ID:	SAMPLE GROUP:	Type of samples (circle one):	ROUTINE	SPECIAL	CONFIRMATION
EEA CLIENT CODE:	COC ID:	SAMPLE GROUP:	SEE ATTACHED KIT ORDER FOR ANALYSES	(check for yes), OR		
TAT requested: rush by adv notice only			List ALL ANALYSES REQUIRED (enter number of bottles sent for each test for each sample)			
SAMPLE DATE	SAMPLE TIME	SAMPLE ID	CLIENT LAB ID	MATRIX	FIELD DATA	SAMPLER COMMENTS
6/24/12	0900	WELL 24 RAW		RAW		
	0900	WELL 24 F1		CFW		
	0900	WELL 24 F2		CFW		
	1200	WELL 24 F1		CFW		
	1200	WELL 24 F2		CFW		
	1300	WELL 24 F1		CFW		
	1300	WELL 24 F2		CFW		
4/3	0845	WELL 24 F1		CFW		
	0845	WELL 24 F2		CFW		
	1200	WELL 24 F1		CFW		

* MATRIX TYPES: RSW = Raw Surface Water
RGW = Raw Ground Water
CFW = Chlor(am)inated Finished Water
FW = Other Finished Water
SEAW = Sea Water
WW = Waste Water
BW = Bottled Water
SW = Storm Water
SO = Soil
SL = Sludge
O = Other - Please Identify

SAMPLED BY:	PRINT NAME	COMPANY/TITLE	DATE	TIME
RELINQUISHED BY:	DAVID JONES	WRT LOPREST	6/14/12	1425
RECEIVED BY:	Jesus Castaneda	City of Mendocino Water Division	6/15/12	1835
RELINQUISHED BY:				
RECEIVED BY:	Salvador Mora	CGA	6/16/12	1314



eurofins

Eaton Analytical

CHAIN OF CUSTODY RECORD

EUROFINS EATON ANALYTICAL USE ONLY:

750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629
Phone: 626 386 1100
Fax: 626 386 1101
800 566 LABS (800 566 5227)
Website: www.EatonAnalytical.com

LOGIN COMMENTS:

SAMPLES CHECKED AGAINST COC BY: B

750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629

Phone: 626 386 1100
Fax: 626 386 1101

800 566 LABS (800 566 5227)

Website: www.EatonAnalytical.com

SAMPLE TEMP RECEIVED AT:

☐ (Other) IR Gun ID = 63144 (Observation = 0.5 °C) (check for yes)

☒ Monrovia IR Gun ID = 63144 (Observation = 0.5 °C) (Final = 0.4 °C)

Compliance Acceptance Criteria: (Chemistry: 4 ± 2 °C) (Microbiology: < 10 °C)

TYPE OF ICE: Real ☒ Synthetic ☐ No Ice ☐

CONDITION OF ICE: Frozen ☒ Partially Frozen ☐ Thawed ☐ N/A

METHOD OF SHIPMENT: Pick-Up / Walk-In / FedEx / UPS / DHL / Area Fast / Top Line / Other: UPS

506209015486

TO BE COMPLETED BY SAMPLER:

COMPANY/AGENCY NAME: <u>City of Monrovia Water Division</u>		PROJECT CODE: <u>289950</u>	COMPLIANCE SAMPLES - Requires state forms ☐ NON-COMPLIANCE SAMPLES ☒		(check for yes)	
EEA CLIENT CODE: <u>Monrovia 20</u>	COC ID:	SAMPLE GROUP: <u>Well 2nd 2-2</u>	Type of samples (circle one): ROUTINE ☐ SPECIAL ☐ CONFIRMATION ☐		REGULATION INVOLVED: <u>52000</u> (eg. SDWA, NPDES, etc.)	
TAT requested: rush by adv notice only		STD <u>1</u> wk <u>3</u> day <u>2</u> day <u>1</u> day	SEE ATTACHED KIT ORDER FOR ANALYSES List ALL ANALYSES REQUIRED (enter number of bottles sent for each test for each sample)			
SAMPLE DATE	SAMPLE TIME	SAMPLE ID	CLIENT LAB ID	MATRIX	FIELD DATA	SAMPLER COMMENTS
6/19/21	1200	WEN24 F2		CFW		
6/19/21	1300	WEN24 F1		CFW		
6/19/21	1400	WEN24 F2		CFW		
6/19/21	0800	WEN24 F1		CFW		
6/19/21	0900	WEN24 F2		CFW		
6/19/21	1100	WEN24 RAW		RAW		
6/19/21	1100	WEN24 F1		CFW		
6/19/21	1100	WEN24 F2		CFW		
6/19/21	1400	WEN24 F1		CFW		
6/19/21	1400	WEN24 F2		CFW		

* MATRIX TYPES: RSW = Raw Surface Water
RGW = Raw Ground Water
CFW = Chlor(am)inated Finished Water
FW = Other Finished Water
SEAW = Sea Water
WW = Waste Water
BW = Bottled Water
SW = Storm Water
SO = Soil
SL = Sludge
O = Other - Please Identify

SAMPLED BY: <u>[Signature]</u>	PRINT NAME <u>DAVID JONES</u>	COMPANY/TITLE <u>WRT/LOP</u>	DATE <u>6/14/21</u>	TIME <u>1425</u>
RELINQUISHED BY: <u>[Signature]</u>	<u>David Jones</u>	<u>City of Monrovia Water Division</u>	<u>6/15/21</u>	<u>1435</u>
RECEIVED BY:				
RELINQUISHED BY:				
RECEIVED BY:	<u>Salvador Mora</u>	<u>WRT</u>	<u>6/16/21</u>	<u>1313</u>

750 Royal Oaks Drive, Suite 100
Monrovia, California 91016-3629
(626) 386-1100 FAX (866) 988-3757

Created Date & Time: 5/3/2021 11:07:12AM

Note: Sampler Please return this paper with your samples

Kit #: 289950  
Created By: Vanessa Berry - [ZIA8]
Deliver By: 05/12/2021
STG: Bottle Orders
Ice Type: W
Client ID: MERIDIAN-ID
Project Code: SPECIAL Bottle Orders
Group Name: Pilot Study
PO#/JOB#:
Description: No Schedule

Ship Sample Kits to
City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300
Attn: Jason Smith
Phone: 208-519-0003

Send Report to
City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300
Attn: Jason Smith
Phone: 208-519-0003

Billing Address
City of Meridian
2235 NW 8th Street
Meridian, ID 83642-2300
Attn: Dennis Teller
Phone: 1-208-985-1200

# of Sample Tests	Bottle Qty - Type [preservative information]	Total	UN DOT #
20 Ammonia Nitrogen	1 - 250ml poly [0.5 ml H2SO4 (50%)]	20	UN1830
20 Iron Total ICAP, Manganese Total ICAP	1 - 500ml acid poly [2ml HNO3 (18%)]	20	UN2031
Sum Tests: 40		Sum Bottles: 40	
Comments			
include return shipping labels			
COCs			

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Comments

Report: 941320
Project: SPECIAL
Group: Pilot Study

City of Meridian
Jason Smith
2235 NW 8th Street
Meridian, ID 83642-2300

Flags Legend:

M2 - Matrix spike recovery was low; the associated blank spike recovery was acceptable.

R4 - MS/MSD RPD exceeded the method acceptance limit. Recovery met acceptance criteria.

Tel: (626) 386-1100
Fax: (626) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Hits

Report: 941320
Project: SPECIAL
Group: Pilot Study

City of Meridian
Jason Smith
2235 NW 8th Street
Meridian, ID 83642-2300

Samples Received on:
06/16/2021 1314

Analyzed	Analyte	Sample ID	Result	Federal MCL	Units	MRL
202106170080 <u>Well 24 RAW</u>						
06/21/2021 13:25	Iron Total ICAP		0.017	0.3	mg/L	0.010
06/21/2021 13:25	Manganese Total ICAP		0.040	0.05	mg/L	0.0020
202106170095 <u>Well 24 RAW</u>						
06/21/2021 13:34	Iron Total ICAP		0.010	0.3	mg/L	0.010
06/21/2021 13:34	Manganese Total ICAP		0.037	0.05	mg/L	0.0020

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Data

Report: 941320
Project: SPECIAL
Group: Pilot Study

City of Meridian
Jason Smith
2235 NW 8th Street
Meridian, ID 83642-2300

Samples Received on:
06/16/2021 1314

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
Well 24 RAW (202106170080)						Sampled on 06/12/2021 0900			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:25	1335663	1336110	(EPA 200.7)	Iron Total ICAP	0.017	mg/L	0.010	1
06/17/21	06/21/21 13:25	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	0.040	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:31		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F1 (202106170081)						Sampled on 06/12/2021 0900			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:26	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:26	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 14:00		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F2 (202106170082)						Sampled on 06/12/2021 0900			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:27	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:27	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 14:01		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F1 (202106170083)						Sampled on 06/12/2021 1200			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:32	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:32	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 14:04		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F2 (202106170084)						Sampled on 06/12/2021 1200			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:33	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:33	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:32		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F1 (202106170085)						Sampled on 06/12/2021 1500			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:34	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1

Rounding on totals after summation.

(c) - indicates calculated results. Analysis is a calculated result. Reported results are not rounded until the final step before reporting. Therefore methods that use a test result with further calculation may have slight differences in final result than the component analyses.

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Data

Report: 941320
Project: SPECIAL
Group: Pilot Study

City of Meridian
Jason Smith
2235 NW 8th Street
Meridian, ID 83642-2300

Samples Received on:
06/16/2021 1314

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
06/17/21	06/21/21 13:34	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:33		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F2 (202106170086)						Sampled on 06/12/2021 1500			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:13	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:13	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 14:05		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F1 (202106170087)						Sampled on 06/13/2021 0845			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:16	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:16	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 14:07		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F2 (202106170088)						Sampled on 06/13/2021 0845			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:19	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:19	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:34		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F1 (202106170089)						Sampled on 06/13/2021 1200			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:20	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:20	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:40		1337362	(EPA 350.1)	Ammonia Nitrogen	ND (M2,R4)	mg/L	0.050	1
Well 24 F2 (202106170090)						Sampled on 06/13/2021 1200			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:21	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:21	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 14:08		1337104	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F1 (202106170091)						Sampled on 06/13/2021 1500			

Rounding on totals after summation.

(c) - indicates calculated results. Analysis is a calculated result. Reported results are not rounded until the final step before reporting. Therefore methods that use a test result with further calculation may have slight differences in final result than the component analyses.

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Data

Report: 941320
Project: SPECIAL
Group: Pilot Study

City of Meridian
Jason Smith
2235 NW 8th Street
Meridian, ID 83642-2300

Samples Received on:
06/16/2021 1314

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:22	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:22	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:43		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F2 (202106170092)						Sampled on 06/13/2021 1500			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:23	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:23	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:45		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F1 (202106170093)						Sampled on 06/14/2021 0800			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:24	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:24	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:46		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F2 (202106170094)						Sampled on 06/14/2021 0800			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:35	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:35	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:47		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 RAW (202106170095)						Sampled on 06/14/2021 1100			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:34	1335663	1336110	(EPA 200.7)	Iron Total ICAP	0.010	mg/L	0.010	1
06/17/21	06/21/21 13:34	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	0.037	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 14:21		1337107	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F1 (202106170096)						Sampled on 06/14/2021 1100			
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:36	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:36	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1

Rounding on totals after summation.

(c) - indicates calculated results. Analysis is a calculated result. Reported results are not rounded until the final step before reporting. Therefore methods that use a test result with further calculation may have slight differences in final result than the component analyses.

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Data

Report: 941320
Project: SPECIAL
Group: Pilot Study

City of Meridian
Jason Smith
2235 NW 8th Street
Meridian, ID 83642-2300

Samples Received on:
06/16/2021 1314

Prepped	Analyzed	Prep Batch	Analytical Batch	Method	Analyte	Result	Units	MRL	Dilution
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 14:24		1337107	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F2 (202106170097)					Sampled on 06/14/2021 1100				
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:37	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:37	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:48		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F1 (202106170098)					Sampled on 06/14/2021 1400				
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:38	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:38	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:52		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1
Well 24 F2 (202106170099)					Sampled on 06/14/2021 1400				
EPA 200.7 - ICP Metals									
06/17/21	06/21/21 13:39	1335663	1336110	(EPA 200.7)	Iron Total ICAP	ND	mg/L	0.010	1
06/17/21	06/21/21 13:39	1335663	1336110	(EPA 200.7)	Manganese Total ICAP	ND	mg/L	0.0020	1
EPA 350.1 - Ammonia Nitrogen									
	06/24/21 12:53		1337362	(EPA 350.1)	Ammonia Nitrogen	ND	mg/L	0.050	1

Rounding on totals after summation.

(c) - indicates calculated results. Analysis is a calculated result. Reported results are not rounded until the final step before reporting. Therefore methods that use a test result with further calculation may have slight differences in final result than the component analyses.

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Report: 941320
Project: SPECIAL
Group: Pilot Study

City of Meridian

ICP Metals

Prep Batch: 1335663 Analytical Batch: 1336110

Analysis Date: 06/21/2021

202106170080	Well 24 RAW
202106170081	Well 24 F1
202106170082	Well 24 F2
202106170083	Well 24 F1
202106170084	Well 24 F2
202106170085	Well 24 F1
202106170086	Well 24 F2
202106170087	Well 24 F1
202106170088	Well 24 F2
202106170089	Well 24 F1
202106170090	Well 24 F2
202106170091	Well 24 F1
202106170092	Well 24 F2
202106170093	Well 24 F1
202106170094	Well 24 F2
202106170095	Well 24 RAW
202106170096	Well 24 F1
202106170097	Well 24 F2
202106170098	Well 24 F1
202106170099	Well 24 F2

[illegible]

Ammonia Nitrogen

Analytical Batch: 1337104

Analysis Date: 06/24/2021

202106170081	Well 24 F1
202106170082	Well 24 F2
202106170083	Well 24 F1
202106170086	Well 24 F2
202106170087	Well 24 F1
202106170090	Well 24 F2

Analyzed by: MIA8
Analyzed by: MIA8
Analyzed by: MIA8
Analyzed by: MIA8
Analyzed by: MIA8
Analyzed by: MIA8

Ammonia Nitrogen

Analytical Batch: 1337107

Analysis Date: 06/24/2021

202106170095	Well 24 RAW
202106170096	Well 24 F1

Analyzed by: MIA8
Analyzed by: MIA8

Ammonia Nitrogen

Analytical Batch: 1337362

Analysis Date: 06/24/2021

202106170080	Well 24 RAW
202106170084	Well 24 F2
202106170085	Well 24 F1
202106170088	Well 24 F2
202106170089	Well 24 F1
202106170091	Well 24 F1
202106170092	Well 24 F2
202106170093	Well 24 F1

[illegible]

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory QC Summary

Report: 941320
Project: SPECIAL
Group: Pilot Study

City of Meridian

202106170094	Well 24 F2	Analyzed by: MIA8
202106170097	Well 24 F2	Analyzed by: MIA8
202106170098	Well 24 F1	Analyzed by: MIA8
202106170099	Well 24 F2	Analyzed by: MIA8

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Report: 941320
Project: SPECIAL
Group: Pilot Study

City of Meridian

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield(%)	Limits (%)	RPD Limit(%)	RPD%
ICP Metals by EPA 200.7									
Analytical Batch: 1336110					Analysis Date: 06/21/2021				
LCS1	Iron Total ICAP		5	5.18	mg/L	104	(85-115)		
LCS2	Iron Total ICAP		5	5.19	mg/L	104	(85-115)	20	0.19
MBLK	Iron Total ICAP			<0.004850	mg/L				
MRL_CHK	Iron Total ICAP		0.01	0.0105	mg/L	105	(50-150)		
MS_202106170086	Iron Total ICAP	ND	5	5.17	mg/L	103	(70-130)		
MS2_202106170082	Iron Total ICAP	ND	5	5.15	mg/L	103	(70-130)		
MSD_202106170086	Iron Total ICAP	ND	5	5.22	mg/L	104	(70-130)	20	1
MSD2_202106170082	Iron Total ICAP	ND	5	5.18	mg/L	104	(70-130)	20	0.49
LCS1	Manganese Total ICAP		2	2.06	mg/L	103	(85-115)		
LCS2	Manganese Total ICAP		2	2.06	mg/L	103	(85-115)	20	0.0
MBLK	Manganese Total ICAP			<0.000700	mg/L				
MRL_CHK	Manganese Total ICAP		0.002	0.00219	mg/L	110	(50-150)		
MS_202106170086	Manganese Total ICAP	ND	2	2.05	mg/L	102	(70-130)		
MS2_202106170082	Manganese Total ICAP	ND	2	2.04	mg/L	102	(70-130)		
MSD_202106170086	Manganese Total ICAP	ND	2	2.07	mg/L	104	(70-130)	20	1.0
MSD2_202106170082	Manganese Total ICAP	ND	2	2.06	mg/L	103	(70-130)	20	1.1
Ammonia Nitrogen by EPA 350.1									
Analytical Batch: 1337104					Analysis Date: 06/24/2021				
LCS3	Ammonia Nitrogen		1	0.992	mg/L	99	(90-110)		
LCS4	Ammonia Nitrogen		1	1.01	mg/L	101	(90-110)	20	1.8
MBLK	Ammonia Nitrogen			<0.00674	mg/L				
MRL_CHK	Ammonia Nitrogen		0.05	0.0530	mg/L	106	(79-126)		
MS1_202106170581	Ammonia Nitrogen	0.061	1	1.15	mg/L	109	(90-110)		
MS1_202106170591	Ammonia Nitrogen	ND	1	0.682	mg/L	<u>68</u>	(90-110)		
MSD1_202106170581	Ammonia Nitrogen	0.061	1	1.13	mg/L	107	(90-110)	20	1.8
MSD1_202106170591	Ammonia Nitrogen	ND	1	0.736	mg/L	<u>73</u>	(90-110)	20	7.6
Ammonia Nitrogen by EPA 350.1									
Analytical Batch: 1337107					Analysis Date: 06/24/2021				
LCS3	Ammonia Nitrogen		1	0.990	mg/L	99	(90-110)		
LCS4	Ammonia Nitrogen		1	1.02	mg/L	102	(90-110)	20	3.0
MBLK	Ammonia Nitrogen			<0.00674	mg/L				
MRL_CHK	Ammonia Nitrogen		0.05	0.0500	mg/L	100	(79-126)		
MS1_202106170095	Ammonia Nitrogen	ND	1	1.10	mg/L	107	(90-110)		
MS1_202106170776	Ammonia Nitrogen	0.83	1	2.04	mg/L	<u>121</u>	(90-110)		

Spike recovery is already corrected for native results.

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.

Criteria for MS and Dup are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

RPD not calculated for LCS2 when different a concentration than LCS1 is used.

RPD not calculated for Duplicates when the result is not five times the MRL (Minimum Reporting Level).

(S) - Indicates surrogate compound.

(I) - Indicates internal standard compound.

Tel: (626) 386-1100
Fax: (626) 988-3757
1 800 566 LABS (1 800 566 5227)

Report: 941320
Project: SPECIAL
Group: Pilot Study

City of Meridian

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield(%)	Limits (%)	RPD Limit(%)	RPD%
MSD1_202106170095	Ammonia Nitrogen	ND	1	1.02	mg/L	100	(90-110)	20	7.5
MSD1_202106170776	Ammonia Nitrogen	0.83	1	2.02	mg/L	<u>119</u>	(90-110)	20	0.74
Ammonia Nitrogen by EPA 350.1									
Analytical Batch: 1337362					Analysis Date: 06/24/2021				
LCS3	Ammonia Nitrogen		1	0.981	mg/L	98	(90-110)		
LCS4	Ammonia Nitrogen		1	0.993	mg/L	99	(90-110)	20	1.2
MBLK	Ammonia Nitrogen			<0.00674	mg/L				
MRL_CHK	Ammonia Nitrogen		0.05	0.0510	mg/L	102	(79-126)		
MS1_202106170089	Ammonia Nitrogen	ND	1	0.834	mg/L	<u>82</u>	(90-110)		
MS1_202106170100	Ammonia Nitrogen	ND	1	1.02	mg/L	102	(90-110)		
MSD1_202106170089	Ammonia Nitrogen	ND	1	0.584	mg/L	<u>57</u>	(90-110)	20	<u>35</u>
MSD1_202106170100	Ammonia Nitrogen	ND	1	0.716	mg/L	<u>71</u>	(90-110)	20	<u>35</u>

Spike recovery is already corrected for native results.

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.

Criteria for MS and Dup are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

RPD not calculated for LCS2 when different a concentration than LCS1 is used.

RPD not calculated for Duplicates when the result is not five times the MRL (Minimum Reporting Level).

(S) - Indicates surrogate compound.

(I) - Indicates internal standard compound.

APPENDIX B

Pilot Test Daily Operations Log
Page 66 -72

Line #	Date	Time	Initials	Flow Rate digital gpm	Flow Filter 1 oz gpm	Flow Filter 2 oz gpm	Flow Filter 3 oz gpm	CI Rate cal/cm mL/min	CI Free In Filter 1 mg/L	CI Free Out Filter 2 mg/L	CI Free Out Filter 3 mg/L	Fe (total) In mg/L	Fe (total) Filter 2 mg/L	Fe (total) Filter 1 mg/L	Fe (total) In mg/L	Fe Rate cal/cm mL/min	Flow Out mg/L	Flow In mg/L	Mn (total) In mg/L	Mn (total) Filter 1 mg/L	Mn (total) Filter 2 mg/L	Mn (total) Out mg/L	Pressure In PSI 1 gauge gal	Pressure In PSI 2 gauge gal	Pressure In PSI 3 gauge gal	Pressure Out PSI 3 gauge gal	DP Pres DP 3 psi	Diff Pres DP 2 psi	Pressure In PSI 2 gauge gal	Pressure In PSI 3 gauge gal	Pressure Out PSI 3 gauge gal	Diff Pres DP 3 psi	pH In/Out	Turbidity In/Out NTU	Current RunTime hours	Total RunTime hours	Pool Lab Tested (Y/N)	Notes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	6/12/2021	07:46	DE	3.0	1.5	1.5		6															20.5	18.3	2.3	20.6	18.7	1.9												START																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		08:00		2.95	1.5	1.5		6	131	1.23	0.78												20.6	18.4	2.2	20.6	18.7	1.9																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
		09:00		2.95	1.5	1.5																	20.5	18.2	2.3	20.5	18.6	1.9																	Sample																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
		10:00		2.95	1.5	1.5		6 1/2	110	1.00	0.71												20.5	18.3	2.2	20.6	18.7	1.9																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

Notes:

- Record action taken during pilot in Notes or in space below
- Send picture of Log Sheet at end of every day
- Calibration Column Level is "Up" side down: 200 mL is empty, 0 mL is near full

2 L (7.5% Sodium Hypochlorite)
+ 10 gallons DI WATER
AT 3gpm Flow

Hydraulic Loading Rate: 8 gpm/sf (1.5 gpm per filter)
Backwash Rate: 12 gpm/sf (2.4 gpm) GS/A (BW 8 minutes)
Backwash Rate: 20 gpm/sf (3.9 gpm) Mang-Ox (BW 8 minutes)

1 min BW at 1gpm + 1 cfm/t2 air (12 scale)

[illegible]

Notes:

- Record action taken during pilot in Notes or in space below

- Record action taken during pilot in Notes of in SP
- Send picture of Log Sheets at end of every day

- Send picture of Log Sheets at end of every day
- Calibration Column Level is "upside down". 200 mL is empty, 0 mL is near full

APPENDIX B – CITY OF MERIDIAN DESIGN CHECKLIST

This page intentionally blank.

CITY OF MERIDIAN PUBLIC WORKS

WATER FACILITIES CHECKLIST – DESIGN

4/20/23

STATUS	EXTERIOR CONSIDERATIONS
	Decide on Location/Orientation of building on well lot
	Architectural Checklist for CZC
	Type and Size of Pump – Determined by pump testing/design process ☐ Well outside of pumphouse to enable maintenance (design for freeze protection and consider motor temp issues, noise attenuation)
	Exterior Finish - Coordinate with stakeholders ☐ HOA/ Architectural Committee ☐ Developer ☐ Lease Agreement ☐ Water Division
	Roof Type ☐ Standing Metal Seam (preferred) ☐ Eaves/soffit: Hardie Board only ☐ HOA/ Architectural Committee
	Paving Type – ½” max aggregate in asphalt/permeable paver mix
	Storm Drainage ☐ Permeable surface (pavers preferred)
	Building Signage/Addressing Gate Information Signage ☐ 30”x24” ☐ White Background ☐ Blue Lettering ☐ Blue Meridian Logo ☐ Signs Etc. – Meridian ID Gate Warning Signs ☐ Chemical NFPA Chlorine placard ☐ Chemical NFPA Diesel placard, blue-0, red-2, yellow-0, white-no special condition Fence Signage ☐ Gates or driveways to include “No Parking” sign. Signage-White background with red letters. ☐ “Keep Out” / “Tampering with this facility is a Federal Offense” Building Signage ☐ “High Voltage” ☐ Chemical NFPA Chlorine placard ☐ Chemical NFPA Diesel placard, blue-0, red-2, yellow-0, white-no special condition ☐ “Hearing protection” CITY OF MERIDIAN WELL # 28 - EPDS 028 2658 E. TACONIC DRIVE MUNICIPAL WATER SYSTEM PWS I.D. # ID4010097 DWR # D0053548 / 03N01E32SESWNE FOR EMERGENCY CALL 208-888-5242
	Landscape – ☐ Comply with lease agreement/HOA rules ☐ Keep irrigated landscape outside of fenced area ☐ Discuss tree requirements with Arborist ☐ Low maintenance vegetation ☐ Rubber mulch
	Irrigation System ☐ Control boxes to be located outside of fencing (on the fence) ☐ Valve boxes/backflow prevention/filter to be located outside of fencing ☐ Irrigation provided by HOA PI system

CITY OF MERIDIAN PUBLIC WORKS

WATER FACILITIES CHECKLIST – DESIGN

	STATUS	EXTERIOR CONSIDERATIONS (continued)
		Site Layout ☐ Route fiber conduit from building interior to junction box at property line. ☐ Must be able to pull off road to open gate ☐ Chemical delivery direct to tank. Two-inch exterior fill hookup with cam-lock fitting, check valve, and drain. Need to see while filling (door, window, indicator). ☐ Plan spacing for chlorine truck delivery and for pipe layout when pulling/installing the pump ☐ Ultimate buildout (filter building or blending well) ☐ Determine sewer system connection point. If treatment is envisioned get maximum allowable sewer flow from WW Engineering. ☐ Review 1" water service location with PM ☐ Locate water system connection to maximize contact time before first customer ☐ Determine future replacement well location on site.
		Flush Line Location/Connection ☐ Pressure to gravity inside fence ☐ Air gap with Screen at discharge manhole, example Well 17 treatment. Discharge locations must be fully enclosed with 24 mesh screen ☐ If site conditions allow, provide automatic flush-to-waste with control PLC. This allows well to flush to waste after periods of non-use. ☐ Pressure relief flushes to same box as flush ☐
		Backwash line location/connection (for filter facilities) ☐ Keep minimum 4' separation from building ☐ Air gap with 24 mesh screen at discharge manhole, example Well 27 treatment. Discharge locations must be fully enclosed with 24 mesh screen ☐ Air /vac vents (separate pipe for each cell) drain to flush box (Install unions in piping) ☐ Prevent freezing of ends of air /vac lines outside building ☐ Keep pipes inside as much as possible. When pipe must be outside use stainless steel piping with screw on mesh caps ☐
		HVAC –No heat pumps ☐ Redundant heating (provide conduit/stubs for future gas connection)
		Fence Type – 8ft Classic 3 rail black aluminum (i.e. Montage II or equivalent)
		Gate Type – Vehicle and Man gates to swing both ways with hinges and lock/clasp welded not bolted. Vehicle gate to be two (2), 10-foot-wide panels.
		Door locks – ☐ Construction cores from Minutemen Lock & Security (paid for by contractor). ☐ Medeco CLIQ Connect Smart Key locks and padlocks from Minuteman Lock & Security required at final completion. Required for all lockable doors, panels, gates, monitoring wells, etc.
		Knox Box – Mounted on exterior fence

CITY OF MERIDIAN PUBLIC WORKS

WATER FACILITIES CHECKLIST – DESIGN

	STATUS	EXTERIOR CONSIDERATIONS (continued)
		Card Reader System – RfID badge readers (RDR-805W1AKB-P) shall be installed inside each access door to the building (coordinate with City if excessive) for someone to swipe their badge as they enter the building. This is not connected to door locks, etc. There should also be a badge reader installed in the door of the HMI Panel. The readers should be configured with their own IP addresses, and connected via CAT6 Ethernet cable to a POE port on a dedicated Ethernet switch. The dedicated POE switch should also be connected to the Ethernet switch inside the Well PLC LCP.
	STATUS	INTERIOR CONSIDERATIONS
		Generator – Permanent (if possible) ☐ All transfer switches to be automatic ☐ Capable of sending the following analog output to SCADA: 1) Oil temp (degrees F) 2) Oil pressure 3) Cooling system level 4) Cooling system temp (degrees F) 5) Fuel level (gallons) 6) Battery voltage (dc) 7) Battery charge current (Amps) 8) Volts Phase A 9) Volts Phase B 10) Volts Phase C 11) Average Voltage 12) Current Phase A 13) Current Phase B 14) Current Phase C 15) Average current 16) Generator Frequency 17) Utility Power Voltage Present (Y/N). Discreet point 18) Generator Power Present (Y/N). Discreet point 19) Total power KW 20) Engine Rpm 21) Engine hours ☐ If site has no permanent generator then provide a connection box with male camlock connections series 16.
		Idaho Power – Power meter mounted to transformer ☐ Building with portable generator require to be counter-clockwise rotation at the transformer
		Transformer – Coordinate with Idaho Power for location and size ☐ Determine available fault current for design use
		Separate electrical and blower rooms preferred
		Separate chemical room required
		Eyewash Station with Shower – Well water satisfies “tepid” temp requirement ☐ Provide non-slip grating for eyewash station
		Building doors to have a hold-open mechanism on ‘door closer’
		Paint Colors ☐ Walls/Ceiling – SW7006 Extra White (Sherwin Williams) ☐ Pipes – Antique White: SW6119 (Sherwin Williams)

CITY OF MERIDIAN PUBLIC WORKS

WATER FACILITIES CHECKLIST – DESIGN

	STATUS	INTERIOR CONSIDERATIONS (continued)
		Paint Colors ☐ Exterior Exposed Piping (flush line): To be selected when picking exterior building colors (Suggestion: Grizzle Gray SW7068) ☐ Floor – Company; Key Resin West - o Key 535 - o Key 803 Chiplock - o 450 Topcoat - o Color: Apache Tan ☐ Doors/Frames – Grey or match existing
		Asset Management ☐ Assets identified on plans (by asset tag) ☐ Master sheet with table that has all assets with page locations and Asset Management Standard Notes ☐ Asset Management team to install asset labels ☐ Include asset item disposition table ☐ Contractor to provide estimated asset costs (only for tagged assets)
		Floor Drain Type - Trench Drain
		Fire Prevention ☐ Fire Sprinkler - MUST meet Fire Department requirements ☐ Fire Riser Room Heater - MUST meet Fire Department requirements ☐ Room temperature to SCADA ☐ Consider alternate fireproofing to avoid fire sprinklers, particularly in electrical room
		Fire Alarm - It is the City's intent that the fire alarm wiring and device be labeled in the same manner as to what is laid out in the electrical specifications. Design consultant to develop fire alarm specs accordingly.
		Chlorine Tank – ☐ Single wall inside a catch basin, example well 17. Openings only at top, no penetrations allowed in the wall of the tank. ☐ Secondary Containment to be outside manhole. Drain under chlorine injector drains to secondary containment also. ☐ Contractor to power wash the whole chlorine tank after making pipe penetrations
		Filter Tank- ☐ Underdrain style. Must be able to inspect underdrain from lower hatches. ☐ Rust free- coating spec / inspection- holiday testing. ☐ Longer legs (36") instead of concrete pedestals ☐ Face piping design to put valves at 60" or less on both sides. No face piping below finished floor if possible. ☐ Effluent meters on each cell ☐ Pressure cooker style hatches on top. Bolted flange style on bottom. Install air/vac line on each upper tank access hatch on flange area. ☐ Supplier to provide finish painted tank. Antique white epoxy -SW 6119. ☐ No direct tapping on face piping-use saddles. ☐ All connection piping to be brass or stainless ☐ Face piping-cement mortar lined ductile

CITY OF MERIDIAN PUBLIC WORKS

WATER FACILITIES CHECKLIST – DESIGN

	STATUS	INTERIOR CONSIDERATIONS (continued)
		Chlorine Pump – Non-Treatment projects: Grundfos Smart Digital DDA 0-4.5GPH, Treatment projects: LMI EXCEL XR 16 gph 150 psi
		Chlorine Analyzer ☐ Type: Concentrations higher than 0.05 mg/l manganese or 0.3 mg/l Iron use CL10F or Rosemount FCL
		Chlorine Analyzer If concentrations are lower than 0.05 mg/l manganese or 0.3 mg/l Iron use CL17SC ☐ Meter and mount for MXUs on wall ☐ Drain to sewer (not seepage bed)
		Chlorine Gas Detector ☐ Type: Sensidyne ☐ Go/No go lights for gas detection ☐ Test station (located in PLC) ☐ Provide appropriate signage per spec
		METERS ☐ Meters on: - Well discharge (influent to filter) - Filter flow (one per cell) - Total effluent flow - Filter to waste - Backwash ☐ MAG Meter type – McCrometer with AMI output
		PRESSURE TRANSDUCERS ☐ On both influent and effluent sides of filter ☐ Endress Hauser Ceraphant PTC 31B -1-600 psi ☐ To be on own tap. No sample faucet.
		WELL HEAD PIPING ☐ Install sample tap upstream of the check valve
	STATUS	PROJECT COMMUNICATIONS
		DEQ Preliminary Engineering Report Approval – Engineers draft and submit
		Use New Source Checklist? YES / NO
	STATUS	ELECTRICAL SPECIFICATIONS
		Reference Meridian Electrical Standards Specifications and Standard Drawings February 2023 ARC flash Study and Labeling ☐ Arc flash study and labeling to be provided by DC Engineering, paid for by the City, and coordinated by the contractor ☐ Refer to guidelines Power System Study Scope of Work found in Engineering Checklist on the Intranet Confirm panel ratings conform to ARC flash requirements ☐ Identify and provide proper means to mitigate arc flash PPE levels to 8 Cal or less on ALL Electrical equipment with the exception of the main breaker. This is to be done before any equipment is purchased.
		HMI/PLC – Allen Bradley w/ Compact Logix. For more complex projects check with SCADA Administrator.

CITY OF MERIDIAN PUBLIC WORKS

WATER FACILITIES CHECKLIST – DESIGN

	STATUS	ELECTRICAL SPECIFICATIONS (continued)
		SCADA ☐ Cellular Switch provided by IT ☐ Surge protection shunt ☐ Condition monitoring (flow, speed, temp, vibration, etc.) ☐ Install RTD input card in the PLC ☐ Power monitoring (line and load) ☐ LCP to be sized for future expansion
		Vertical Turbine Well Motor/VFD ☐ Ceramic coated races for bearings-top / Bushings-bottom ☐ Grounding straps for motor ☐ Ethernet enabled VFD's (Allen Bradley) dv/dt filters after VFD for all submersible motors ☐ The VFD chassis fans need to be temp controlled via t-stat set to 90 degrees. ☐ Motor temperature sensors mounted internally. Use stator winding RTD (resistance temperature detectors- 2 per phase) installed at factory or during a rewind. Platinum only. This means 6 new I/Os for the PLC to track. VFD Door Mounted Requirements ☐ <u>24V PLC Input</u> ☐ HIM module ☐ HOA switch ☐ Hour meter for motor ☐ RUN/FAULT/Power ON (ALL LED push to test type)
		Emergency wall mounted egress lights not to exceed 8 ft above finished floor.
		<u>Homac flood seal or approved equal on all in-ground splices</u>
		All analog devices servicing the pump or monitoring well to terminate in a hinged covered junction box on DIN rail mounted terminals <u>Examples include:</u> pressure transducers, down-well transducers, flow meter, vibration, temp, rpm, chlorine analyzers, chlorine pumps, conditional based monitoring equipment etc.
		For monitoring wells: ☐ 120V service to monitoring wells to be installed in separate conduit ☐ Provide GFI power outlet at monitoring well ☐ Provide heater with thermostat, indicator light, at well, if above-ground artesian zones exist ☐ Provide separate 2" conduit for down-hole transducers ☐ Transducers installed at 100 ft unless monitoring wells levels are lower. Make/model to be Keller Microlevel submersible level transmitter 0-50 psi. ☐ Transducers to be PSIA transducers (non-vented) with a barometric sensor up top for SCADA use. ☐ Conduit to terminate in a hinged covered junction box on DIN rail mounted terminals
	STATUS	ELECTRICAL STANDARDS
		— Contractor to utilize proper terminal block labels on all PLC modules and label all wires entering and leaving the control panel. This is to be extended to all field wiring and should include all Ethernet, analog, branch circuits etc.

CITY OF MERIDIAN PUBLIC WORKS
WATER FACILITIES CHECKLIST – DESIGN

	STATUS	ELECTRICAL STANDARDS (continued)
		— Labeling everything electrical is very important....every wire needs to be labeled; every panel, junction box, conduit, etc. is to be labeled. — Spare fuses (100%) for all vendor panels and disconnects — Fuse cabinet installed in electrical room, labeled "Fuse Cabinet" — Occupancy sensors for lighting control (every room) — One photocell for full control of all exterior lights mounted on North facing wall accessible with an 8' ladder. An HOA lighting contactor is to be located in the electrical room for exterior lighting. — Filter PLC panels are to utilize same material specs as Well PLC panels. — All indicator lights to be LED push to test including vendor supplied panels. Include blower starter panels, exhaust fan starter, go/no go stations, all vendor provided equipment. — LED lighting for all internal and external lighting. Utilize lumark XTOR fixtures for external lights Power monitoring of both motor and building service with Ethernet communications back to PLC incorporated into MCC. Needs to be wired to the individual phase legs right after the main circuit breaker. (Allen Bradley type) — Power monitoring of 120/208V house panel via KELE# 460 for phase loss protection wired back to PLC for alarming. — Install UPS status alarming and door mount UPS in control panel. UPS to be Toshiba 1000 and this should extend to any filter PLC UPS as well. — UPS bypass switch by C and C Power or approved equal. — Main service Breaker to be mounted to exterior of building and utilize ARMS unit (Arc reduction maintenance switch). — All sites are to have ALL conduits concealed in walls and under slab. — Provide antenna cabling conduit from PLC enclosure to closest exterior wall. Provide 1" conduit to terminate in a 2 gang box. — All underground conduits to utilize PVC coated rigid elbows and all stubs ups through slab to be PVC coated rigid. — Provide runtime hour meters on VFDs and blower starter where applicable. — Separate electrical room/area. — Removable roof hatch over the VFD location or taller doorways for removal / installation of the VFD (Verify all doorways will accommodate VFD). Slope exterior access to electrical room for installation of equipment.

CITY OF MERIDIAN PUBLIC WORKS
WATER FACILITIES CHECKLIST – DESIGN

	STATUS	COMMISSIONING CHECKLIST ITEMS TO BE INCLUDED IN DESIGN/SPEC
		FOR ALL FACILITIES
		- I/O functionality test (Design engineer to develop list and supplier/contractor to complete) - Chemical and fire alarms function test - Backflow certification - Verify chlorine pump is flow pacing correctly and looking for VFD signal to run. - Verify Chlorine pump turns off at low level. - All alarms are functioning properly including communicating through SCADA. Work with SCADA System Administrator to define alarm list / labeling / nomenclature. - Verify rotation of all pumps and motors - Control System Integrator to provide an IO Checkout form with the following information at a minimum: Data Type, Slot, Point, Description, Pass/Fail, Range, and Tag Name and shall provide completed form as a deliverable for project completion.
		FOR PUMPING FACILITIES
		- Test high pressure shutoff - Set pressure (setting provided by City) and test pressure relief - Run VFD manually and under pressure control
		FOR TREATMENT FACILITIES
		- I/O functionality test including confirmation that valve position feedback is correct (Design engineer to develop list and supplier/contractor to complete) - No leaks (hatches) - Run filter manually and in auto through all cycles for all cells without errors or faults. Complete prior to filter equipment rep leaving site. - Run through simulated high headloss backwash event - Manually place valve in opposite of correct position and put filter in auto to see what it does (stop and alarm is the correct answer) - Test high level alarms in the backwash vaults Contractor to coordinate with PM to set up wastewater inspection of sewer flows during full backwash
		FOR FACILITIES WITH BACKUP POWER GENERATION
		- Conduct load bank testing according to (industry standards) - Run facility on generator continuously for 24 hours or at least the duration of the fuel tank



Meridian, ID

Well 24 Water Treatment Filter

RFP #PW-2425-11083.d

Proposal

August 8, 2024

Alternates

Alternate 1 to include:

- DEDUCT: Change filter media to GreensandPlus™.
 - GreensandPlus™ filter media with an effective size of 0.30 mm to 0.35 mm and a uniformity coefficient not exceeding 1.60 included to provide a vertical bed depth of 36". GreensandPlus™ to be shipped in 50 pound, one-half cubic foot bags for installation by contractors. Skimming of the Greensand Plus shall be performed by the contractor. Approximate total bags: 1,544 (772 ft³). Note that Greensand Plus will have approximately 40% lower backwash rates than pyrolusite.

Sell Price

Tonka Water OptaCell Plus™ Horizontal Pressure Filter System See Cost Proposal Form

OPTIONS – Base and Alternate #1 Designs

Option 1 to include:

- **DEDUCT: Provide Greensand Plus media in lieu of pyrolusite**

1. <u>Provide Greensand Plus media in lieu of pyrolusite</u>	Deduct \$58,900.00
--	--------------------

We do not include the following:

1. Mechanical or electrical installation.
2. Unloading or rigging. The contractor must provide a suitable access to the jobsite.
3. On-site storage or protection of equipment.
4. Pipe, valves or fittings other than those specifically described herein.
5. Pipe supports or hangers.
6. Motor starters, motor controls, disconnects, or any other electrical equipment other than those specifically described herein.
7. Electrical wiring or conduit.
8. Chemical feed tubing, conduit piping, hangers or supports.
9. Pumps or pumping equipment other than those specifically described herein.
10. Concrete, concrete grout or rebar.
11. Disinfection or disinfection / start-up chemicals.
12. Lubricants.
13. Pneumatic tubing or conduit.
14. Control panel wall mounting material or hardware.
15. Anchor bolts or anchoring calculations, unless specifically described herein.
16. Any items not specifically described in this proposal.

Notes:

1. Equipment is quoted f.o.b. factory with full freight allowed to the jobsite.
2. Our proposal does not include any sales or use taxes.
3. If the above proposal includes valves, piping, etc., these are to be shipped loose for assembly and installation by others unless specifically noted to the contrary.
4. Please note that a copy of the contractor's payment and performance bond is required to be forwarded to us as a part of normal credit approval procedures.
5. Kurita America requires partial payments based on shipped material and purchaser's account being current prior to scheduling a field technician for equipment start-up.
6. Kurita America will provide field services as outlined above in this quotation. Kurita America's field service rate is \$1200.00 per day plus travel and per diem expenses. If Kurita America field service personnel arrive on-site after a schedule is established and the project is not ready for the intended services to be performed, Kurita America will invoice for additional days, if required. If the time required is greater than listed in this quotation, Kurita America will invoice purchaser at the above field service rate plus travel and per diem expenses.

Sell Price

Tonka Water OptaCell Plus™ Horizontal Pressure Filter System	\$886,500.00
--	--------------

OPTIONS – Base and Alternate #1 Designs

Option 1 to include:

- **DEDUCTS:**

1.	Provide Greensand Plus media in lieu of pyrolusite	Deduct -Included in above
	Provide 8" valves, meters and piping because of media	
2.	change	\$25,350.00

We do not include the following:

1. Mechanical or electrical installation.
2. Unloading or rigging. The contractor must provide a suitable access to the jobsite.
3. On-site storage or protection of equipment.
4. Pipe, valves or fittings other than those specifically described herein.
5. Pipe supports or hangers.
6. Motor starters, motor controls, disconnects, or any other electrical equipment other than those specifically described herein.
7. Electrical wiring or conduit.
8. Chemical feed tubing, conduit piping, hangers or supports.
9. Pumps or pumping equipment other than those specifically described herein.
10. Concrete, concrete grout or rebar.
11. Disinfection or disinfection / start-up chemicals.
12. Lubricants.
13. Pneumatic tubing or conduit.
14. Control panel wall mounting material or hardware.
15. Anchor bolts or anchoring calculations, unless specifically described herein.
16. Any items not specifically described in this proposal.

Notes:

1. Equipment is quoted f.o.b. factory with full freight allowed to the jobsite.
2. Our proposal does not include any sales or use taxes.
3. If the above proposal includes valves, piping, etc., these are to be shipped loose for assembly and installation by others unless specifically noted to the contrary.
4. Please note that a copy of the contractor's payment and performance bond is required to be forwarded to us as a part of normal credit approval procedures.
5. Kurita America requires partial payments based on shipped material and purchaser's account being current prior to scheduling a field technician for equipment start-up.
6. Kurita America will provide field services as outlined above in this quotation. Kurita America's field service rate is \$1200.00 per day plus travel and per diem expenses. If Kurita America field service personnel arrive on-site after a schedule is established and the project is not ready for the intended services to be performed, Kurita America will invoice for additional days, if required. If the time required is greater than listed in this quotation,

Attachment B

MILESTONE / PAYMENT SCHEDULE

- A. Total and complete compensation for this Agreement shall not exceed **\$861,150.00**.
B. Substantial Completion 480 days from Notice to Proceed. Final Completion 510 days from Notice to Proceed.

MILESTONE DATES/PRICING SCHEDULE		
	DESCRIPTION	AMOUNT
1.	Well 24 Water Treatment Filter (Equipment)	\$861,150.00
	58, 00	
CONTRACT TOTAL.....		<u>\$861,150.00</u>

		Total Cost			Kurita America		
					\$ 945,400.0		
#	Items	Selected	Quantity Required	Unit	Unit Price	Total Cost	
0	No Basket (1)						
#0-1	Well 24 Water Treatment Filter (Equipment)	\$ 945,400.0	1	LS	\$ 945,400.0	\$ 945,400.0	