

AGREEMENT FOR MAINTENANCE SERVICES

Water Distribution System Flushing

THIS AGREEMENT is made and entered into on this 6th day of December, 2015, by and between the City of Manhattan Beach, a municipal corporation ("City") and ValveTek Utility Services, Inc., a New York ("Contractor") (collectively, the "Parties").

RECITALS

A. Contractor submitted a proposal dated December 20th, 2015 ("Proposal"), and represents that it is qualified and able to perform the services ("Services") required by this Agreement.

NOW, THEREFORE, in consideration of the Parties' performance of the promises, covenants, and conditions stated herein, the Parties hereto agree as follows:

Section 1. Incorporation of Proposal. A copy of Contractor's Proposal is attached hereto as Exhibit A and incorporated herein by this reference. In the event of any conflict between the provisions of the Proposal and this Agreement, the provisions of this Agreement shall control.

Section 2. Contractor's Services. Contractor shall perform the Services described in Exhibit A in a manner satisfactory to City and consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions.

Section 3. Term of Agreement. This Agreement shall apply to services rendered on or after January 12, 2016 and shall terminate when the work is completed, unless sooner terminated by the City.

Section 4. Time of Performance. Contractor shall commence its services under this Agreement upon receipt of a written notice to proceed (NTP) from City. Contractor shall complete the Services within sixty seven (67) days of the date of the NTP.

Section 5. Compensation.

(a) City agrees to pay Contractor in accordance with the fee schedule included in the Proposal. In no event shall the Contractor be paid more than \$ 319,749.00 during the term of this Agreement.

(b) Unless expressly provided for in Exhibit A, Contractor shall not be entitled to reimbursement for any expenses. Any expenses incurred by Contractor that are not expressly authorized by this Agreement will not be reimbursed by City.

(c) The City Manager may authorize cumulative increases for additional work up to the lesser of \$20,000 or 10% of the amount set forth in paragraph (a) of this Section 5. Any additional work in excess of this amount shall be approved by the City Council. No payment shall be made for additional work that was not been authorized by the City Manager in writing prior to performance.

Section 6. Method of Payment.

(a) At two week intervals, Contractor shall submit to City a detailed invoice for the Services. The invoice shall describe in detail the Services rendered, and shall state that all Services set forth in the Proposal have been completed, and that the standard specified in Contractor's warranty for the bacteria plate count and coliform level has been achieved. Contractor shall attach to the invoice any supporting documentation reasonably requested by City's Utilities Manager. The invoice shall be signed by an officer of Contractor.

(b) Within five (5) working days of receipt of the completed and signed invoice and supporting certified payroll documentation, the City shall review the invoice and supporting documentation, inspect the site, and verify that the Services have been performed as required by this Agreement. Within 30 days of such verification, City shall pay all undisputed amounts included on the invoice.

Section 7. Independent Contractor. The Parties agree, understand, and acknowledge that Contractor is not an employee of the City, but is solely an independent contractor. Contractor expressly acknowledges and agrees that City has no obligation to pay or withhold state or federal taxes or to provide workers' compensation or unemployment insurance or other employee benefits and that any person employed by Contractor shall not be in any way an employee of the City. As such, Contractor shall have the sole legal responsibility to remit all federal and state income and social security taxes and to provide for his/her own workers' compensation and unemployment insurance and that of his/her employees or subcontractors. Neither City nor any of its agents shall have control over the conduct of Contractor or any of Contractor's employees. Contractor shall not, at any time, or in any manner, represent that it or any of its agents or employees are in any manner agents or employees of City. Contractor shall indemnify and hold harmless City and its elected officials, officers and employees, servants, designated volunteers, and agents serving as independent contractors in the role of City officials, from any and all liability, damages, claims, costs and expenses of any nature to the extent arising from Contractor's personnel practices. City shall have the right to offset against the amount of any fees due to Contractor under this Agreement any amount due to City from Contractor as a result of Contractor's failure to promptly pay to City any reimbursement or indemnification arising under this Section 6.

Section 8. Assignment. This Agreement shall not be assigned, in whole or in part, by Contractor without the prior written approval of City. Any attempt by Contractor to so assign this Agreement or any rights, duties, or obligations arising hereunder shall be void and of no effect.

Section 9. Prevailing Wages. City and Contractor acknowledge that this project is a public work to which prevailing wages apply. The Terms of Compliance with California Labor Law Requirements is attached hereto as Exhibit B and incorporated herein by this reference. Eight hours of labor constitutes a legal day's work.

Section 10. Personnel. Contractor represents that it has, or shall secure at its own expense, all personnel required to perform the Services under this Agreement. All personnel engaged in the work shall be qualified to perform such Services.

Section 11. Permits and Licenses. Contractor shall obtain and maintain during the term of this Agreement all necessary licenses, permits, and certificates required by law for the provision of the Services, including a business license.

Section 12. Debarred, Suspended or Ineligible Contractors. Contractor shall not be debarred throughout the duration of this Agreement. Contractor shall not perform work with any debarred subcontractor pursuant to California Labor Code Section 1777.1 or 1777.7.

Section 13. Compliance with Laws. Contractor shall comply with all applicable federal, state and local laws, ordinances, codes and regulations in force at the time Contractor performs pursuant to this Agreement.

Section 14. Contractor's Representations. Contractor represents, covenants and agrees that: a) Contractor is licensed, qualified, and capable of furnishing the labor, materials, and expertise necessary to perform the services in accordance with the terms and conditions set forth in this Agreement; b) there are no obligations, commitments, or impediments of any kind that will limit or prevent its full performance under this Agreement; c) there is no litigation pending against Contractor, and Contractor is not the subject of any criminal investigation or proceeding; and d) to Contractor's actual knowledge, neither Contractor nor its personnel have been convicted of a felony.

Section 15. Interests of Contractor.

(a) Contractor covenants that it presently has no interest and shall not acquire any interest, direct or indirect, which may be affected by the Services, or which would conflict in any manner with the performance of the Services. Contractor further covenants that, in performance of this Agreement, no person having any such interest shall be employed by it. Furthermore, Contractor shall avoid the appearance of having any interest, which would conflict in any manner with the performance of the Services. Contractor shall not accept any employment or representation during the term of this Agreement which is or may likely make Contractor "financially interested" (as provided in California Government Code §§ 1090 and 87100) in any decision made by City on any matter in connection with which Contractor has been retained.

(b) Contractor further warrants and maintains that it has not employed or retained any person or entity, other than a bona fide employee working exclusively for Contractor, to solicit or obtain this Agreement. Nor has Contractor paid or agreed to pay any person or entity, other than a bona fide employee working exclusively for Contractor,

any fee, commission, gift, percentage, or any other consideration contingent upon the execution of this Agreement. Upon any breach or violation of this warranty, City shall have the right, at its sole and absolute discretion, to terminate this Agreement without further liability, or to deduct from any sums payable to Contractor hereunder the full amount or value of any such fee, commission, percentage or gift.

(c) Contractor warrants and maintains that it has no knowledge that any officer or employee of City has any interest, whether contractual, non-contractual, financial, proprietary, or otherwise, in this transaction or in the business of Contractor, and that if any such interest comes to the knowledge of Contractor at any time during the term of this Agreement, Contractor shall immediately make a complete, written disclosure of such interest to City, even if such interest would not be deemed a prohibited "conflict of interest" under applicable laws as described in this subsection.

Section 16. Insurance.

(a) Contractor shall at all times during the term of this Agreement carry, maintain, and keep in full force and effect, insurance as follows:

1. A policy or policies of Comprehensive General Liability Insurance with coverage at least as broad as Insurance Services Office form CG 00 01, with minimum limits of \$2,000,000 for each occurrence and general aggregate, combined single limit, against any personal injury, death, loss, or damage, including without limitation, blanket contractual liability, and a \$2,000,000 completed operations aggregate.

2. A policy or policies of Comprehensive Vehicle Liability Insurance covering personal injury and property damage, with minimum limits of \$1,000,000 per occurrence combined single limit, covering any vehicle utilized by Contractor in performing the Services required by this Agreement.

3. Workers' compensation insurance as required by the State of California, and Employer's Liability insurance with limits of at least \$1,000,000 for Contractor's employees in accordance with the laws of the State of California, Section 3700 of the Labor Code.

4. A policy or policies of Professional Liability Insurance (errors and omissions) with minimum limits of \$2,000,000 per claim and in the aggregate. Any deductibles or self-insured retentions attached to such policy or policies must be declared to and be approved by City. Further, Contractor agrees to maintain in full force and effect such insurance for one year after performance of work under this Agreement is completed.

(b) Other Insurance Provisions. The general liability and automobile liability policies are to contain, or be endorsed to contain, the following provisions:

1. City, its officers, officials, employees, designated volunteers and agents serving as independent contractors in the role of City officials, are to be covered

as additional insureds as respects: liability arising out of activities performed by or on behalf of Contractor; products and completed operations of Contractor; premises owned, occupied or used by Contractor; or automobiles owned, leased, hired or borrowed by Contractor. The coverage shall contain no limitations on the scope of protection afforded to City, its officers, officials, employees, designated volunteers or agents serving as independent contractors in the role of City officials which are not also limitations applicable to the named insured.

2. For any claims related to this Agreement, Contractor's insurance coverage shall be primary insurance as respects City, its officers, officials, employees, designated volunteers and agents serving as independent contractors in the role of City officials. Any insurance or self-insurance maintained by City, its officers, officials, employees, designated volunteers or agents serving as independent contractors in the role of City officials shall be excess of Contractor's insurance and shall not contribute with it.

3. Contractor'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.

4. Each insurance policy, except for the professional liability policy, required by this clause shall expressly waive the insurer's right of subrogation against City and its elected officials, officers, employees, servants, attorneys, designated volunteers, and agents serving as independent contractors in the role of City officials.

5. Each insurance policy required by this Agreement shall be endorsed to state: should the policy be canceled before the expiration date, the issuing insurer shall mail 30 days' prior written notice to the City.

6. If insurance coverage is canceled or reduced in coverage or in limits, Contractor shall within two business days of notice from insurer, phone, fax and/or notify the City via first class mail, postage prepaid, of the changes to or cancellation of the policy.

(c) The City's Risk Manager may, in writing, amend and/or waive any or all of the insurance provisions set forth herein. In such case, the Contractor shall comply with the insurance provisions required by the City's Risk Manager.

(d) The policy or policies required by this Agreement shall be issued by an insurer admitted in the State of California and with a rating of at least A-;VII in the latest edition of Best's Insurance Guide, unless waved in writing by City's Risk Manager.

(e) Contractor agrees that if it does not keep the aforesaid insurance in full force and effect, City may either immediately terminate this Agreement or, if insurance is available at a reasonable cost, City may take out the necessary insurance and pay, at Contractor's expense, the premium thereon.

(f) All insurance coverages shall be confirmed by execution of endorsements on forms approved by City. The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. All endorsements are to be received and approved by City before services commence. As an alternative to City forms, Contractor's insurer may provide complete, certified copies of all required insurance policies, including endorsements affecting the coverage required by these specifications.

(g) Any deductibles or self-insured retentions must be declared to and approved by City.

(h) Contractor shall require each of its sub-contractors (if any) to maintain insurance coverage that meets all of the requirements of this Agreement.

Section 17. Indemnification.

(a) Contractor's Duty. To the maximum extent permitted by law, Contractor shall defend, indemnify, and hold free and harmless the City, its elected officials, officers, employees, volunteers, agents, successors, assigns, and those City agents serving as independent contractors in the role of City officials (collectively "Indemnitees") from and against any and all claims (including, without limitation, claims for bodily injury, death or damage to property), demands, obligations, damages, actions, causes of action, proceedings, suits, losses, stop payment notices, judgments, fines, liens, penalties, liabilities, costs and expenses of every kind and nature whatsoever, in any manner arising out of or incident to any act, failure to act, error or omission of Contractor or any of its officers, agents, servants, employees, subcontractors, material suppliers, or their officers, agents, servants or employees, arising out of the Agreement, including without limitation, the payment of all consequential damages, attorneys' fees, experts' fees, and other related costs and expenses (individually, a "Claim," or collectively, "Claims"). Further, Contractor shall appoint competent defense counsel approved by the City Attorney at Contractor's own cost, expense and risk, to defend any and all such Claims that may be brought or instituted against Indemnitees. Contractor shall pay and satisfy any judgment, award or decree that may be rendered against Indemnitees in any such Claim. Contractor shall reimburse Indemnitees for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided. Contractor's obligation to indemnify shall not be restricted to insurance proceeds, if any, received by Contractor or Indemnitees. This indemnity shall apply to all Claims regardless of whether any insurance policies are applicable.

(b) Civil Code Exception. Nothing in the paragraph above this one shall be construed to encompass Indemnitees' sole negligence or willful misconduct to the limited extent that the underlying Agreement is subject to Civil Code section 2782(a) or the City's active negligence to the limited extent that the underlying Agreement is subject to Civil Code section 2782(b).

(c) Nonwaiver of Rights. Indemnitees do not and shall not waive any rights that they may possess against Contractor because of the acceptance by City, or the deposit with City, of any insurance policy or certificate required pursuant to this Agreement. This

indemnity provision is effective regardless of any prior, concurrent, or subsequent active or passive negligence by Indemnitees and shall operate to fully indemnify Indemnitees against any such negligence.

(d) **Waiver of Right of Subrogation.** Contractor, on behalf of itself and all parties claiming under or through it, hereby waives all rights of subrogation and contribution against the Indemnitees, while acting within the scope of their duties, from all Claims arising out of or incident to the activities or operations performed by or on behalf of the Contractor regardless of any prior, concurrent or subsequent active or passive negligence by Indemnitees.

(e) **Survival.** The provisions of this Section 17 shall survive the termination of this Agreement and are in addition to any other rights or remedies that Indemnitees may have under the law. Payment is not required as a condition precedent to an Indemnitee's right to recover under this indemnity provision, and an entry of judgment against a Contractor shall be conclusive in favor of the Indemnitee's right to recover under this indemnity provision

Section 18. Termination.

(a) City shall have the right to terminate this Agreement for any reason or for no reason upon five calendar days' written notice to Contractor. Contractor agrees to cease all work under this Agreement on or before the effective date of such notice.

(b) City may at any time, for any reason, with or without cause, suspend this Agreement, or any portion hereof, by serving upon the Contractor written notice. Upon receipt of said notice, the Contractor shall immediately cease all work under this Agreement, unless the notice provides otherwise. If the City suspends only a portion of this Agreement, such suspension shall not make void or invalidate the remainder of this Agreement.

(c) In the event of termination or cancellation of this Agreement by City, due to no fault or failure of performance by Contractor, Contractor shall be paid based on the percentage of work satisfactorily performed at the time of termination. In no event shall Contractor be entitled to receive more than the amount that would be paid to Contractor for the full performance of the Services required by this Agreement. Contractor shall have no other claim against City by reason of such termination, including any claim for compensation.

Section 19. City's Responsibility. City shall provide Contractor with all pertinent data, documents, and other requested information as is available for the proper performance of Contractor's Services.

Section 20. Information and Documents.

(a) Contractor covenants that all data, documents, discussion, or other information (collectively "Data") developed or received by Contractor or provided for performance of this Agreement are deemed confidential and shall not be disclosed or

released by Contractor without prior written authorization by City. City shall grant such authorization if applicable law requires disclosure. Contractor, its officers, employees, agents, or subcontractors, shall not without written authorization from the City Manager or unless requested in writing by the City Attorney, voluntarily provide declarations, letters of support, testimony at depositions, response to interrogatories or other information concerning the work performed under this Agreement or relating to any project or property located within the City. Response to a subpoena or court order shall not be considered "voluntary," provided Contractor gives City notice of such court order or subpoena.

(b) Contractor shall promptly notify City should Contractor, its officers, employees, agents or subcontractors be served with any summons, complaint, subpoena, notice of deposition, request for documents, interrogatories, request for admissions or other discovery request, court order or subpoena from any party regarding this Agreement and the work performed thereunder or with respect to any project or property located within the City. City retains the right, but has no obligation, to represent Contractor and/or be present at any deposition, hearing or similar proceeding. Contractor agrees to cooperate fully with City and to provide City with the opportunity to review any response to discovery requests provided by Contractor. However, the City's right to review any such response does not imply or mean the right by City to control, direct, or rewrite said response.

(c) All Data required to be furnished to City in connection with this Agreement shall become the property of City, and City may use all or any portion of the Data submitted by Contractor as City deems appropriate. Upon completion of, or in the event of termination or suspension of this Agreement, all original documents, designs, drawings, maps, models, computer files containing data generated for the work, surveys, notes, and other documents prepared in the course of providing the Services shall become the sole property of the City and may be used, reused or otherwise disposed of by City without Contractor's permission.

(d) Contractor shall maintain complete and accurate records with respect to sales, costs, expenses, receipts and other such information required by City that relate to the performance of the Services. All such records shall be maintained in accordance with generally accepted accounting principles and shall be clearly identified and readily accessible. Contractor shall provide free access to City, its designees and representatives at reasonable times, and shall allow City to examine and audit said books and records, to make transcripts therefrom as necessary, and to inspect all work, data, documents, proceedings and activities related to this Agreement. Such records, together with supporting documents, shall be maintained for a period of 3 years after receipt of final payment.

(e) Contractor's covenants under this Section shall survive the termination of this Agreement.

Section 21. Default

(a) Contractor's failure to comply with the provisions of this Agreement shall constitute a default. In the event that Contractor is in default for cause under the terms of this Agreement, City shall have no obligation or duty to continue compensating Contractor for any work performed after the date of default and can terminate this Agreement immediately by written notice to Contractor. If such failure by Contractor to make progress in the performance of work hereunder arises out of causes beyond Contractor's control, and without fault or negligence of Contractor, it shall not be considered a default.

(b) If the City Manager or his delegate determines that the Contractor is in default in the performance of any of the terms or conditions of this Agreement, City shall serve the Contractor with written notice of the default. The Contractor shall have ten (10) days after service upon it of said notice in which to cure the default by rendering a satisfactory performance. In the event that the Contractor fails to cure its default within such period of time, the City shall have the right, notwithstanding any other provision of this Agreement, to terminate this Agreement without further notice and without prejudice to any other remedy to which it may be entitled at law, in equity or under this Agreement.

Section 22. Changes in the Services. City shall have the right to order, in writing, changes in the Services or the services to be performed. Any changes in the Services requested by Contractor must be made in writing and approved by both Parties.

Section 23. Notice. Any notices, bills, invoices, etc. required by this Agreement shall be deemed received on (a) the day of delivery if delivered by hand during the receiving party's regular business hours or by facsimile before or during the receiving party's regular business hours; or (b) on the second business day following deposit in the United States mail, postage prepaid, to the addresses set forth below, or to such other addresses as the Parties may, from time to time, designate in writing pursuant to this section.

If to City: City of Manhattan Beach
3621 Bell Avenue
Manhattan Beach, California 90266
Attn: Raul Saenz, Utilities Manager

With a copy to: City of Manhattan Beach
1400 Highland Avenue
Manhattan Beach, California 90266
Attn: City Manager

If to Contractor: VakveTek, Inc.
16 Interhaven Avenue
North Plainfield, NJ 07060
Attn: Jeff Favina

Section 24. Attorneys' Fees. If a party commences any legal, administrative, or other action against the other party arising out of or in connection with this Agreement, the prevailing party in such action shall be entitled to have and recover from the losing party all of its attorneys' fees and other costs incurred in connection therewith, in addition to such other relief as may be sought and awarded.

Section 25. Entire Agreement. This Agreement represents the entire integrated agreement between City and Contractor, and supersedes all prior negotiations, representations, or agreements, either written or oral. This Agreement may be amended only by a written instrument signed by both City and Contractor.

Section 26. Governing Law. The interpretation and implementation of this Agreement shall be governed by the domestic law of the State of California.

Section 27. Venue. Any litigation concerning this Agreement shall take place in the municipal, superior, or federal district court with geographic jurisdiction over the City of Manhattan Beach.

Section 28. City Not Obligated to Third Parties. City shall not be obligated or liable under this Agreement to any party other than Contractor.

Section 29. Third Party Claims. City shall have full authority to compromise or otherwise settle any claim relating to the Agreement at any time.

Section 30. Construction. In the event of any asserted ambiguity in, or dispute regarding the interpretation of any matter herein, the interpretation of this Agreement shall not be resolved by any rules of interpretation providing for interpretation against the party who causes the uncertainty to exist or against the party who drafted the Agreement or who drafted that portion of the Agreement.

Section 31. Non-waiver of Terms, Rights and Remedies. Waiver by either party of any one or more of the conditions of performance under this Agreement shall not be a waiver of any other condition of performance under this Agreement. In no event shall the making by the City of any payment to Contractor constitute or be construed as a waiver by the City of any breach of covenant, or any default which may then exist on the part of Contractor, and the making of any such payment by the City shall in no way impair or prejudice any right or remedy available to the City with regard to such breach or default.

Section 32. Exhibits; Precedence. All documents referenced as exhibits in this Agreement are hereby incorporated in this Agreement. In the event of any discrepancy between the express provisions of this Agreement and the provisions of any document incorporated herein by reference, the provisions of this Agreement shall prevail.

Section 33. Corporate Authority. The persons executing this Agreement on behalf of the Parties warrant that they are duly authorized to execute this Agreement on behalf of said Parties and that by their execution, the Parties are formally bound to the provision of this Agreement.

Section 34. Severability. Invalidation of any provision contained herein or the application thereof to any person or entity by judgment or court order shall in no way affect any of the other covenants, conditions, restrictions, or provisions hereof, or the application thereof to any other person or entity, and the same shall remain in full force and effect.

Section 35. Counterparts. This Agreement may be executed in counterpart originals, duplicate originals, or both, each of which is deemed to be an original for all purposes.

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

EXECUTED on the date first written above at Manhattan Beach, California.

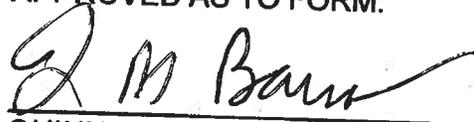
CITY OF MANHATTAN BEACH:

MARK DANAJ
City Manager

ATTEST:

LIZA TAMURA
City Clerk

APPROVED AS TO FORM:



QUINN M. BARROW
City Attorney


Name: Jeff Fayina
Title: Vice President of Field Operations

EXHIBIT A
CONTRACTOR'S PROPOSAL



**Proposal for Operational NO-DES Water Main Flushing
for
City of Manhattan Beach**

December 20, 2015

Mr. Shawn Igoe, Water Supervisor
City of Manhattan Beach
Department of Water
3621 Bell Avenue
Manhattan Beach, CA 90266

I. SCOPE OF SERVICES

ValveTek Utility Services wishes to extend this proposal for Contract Operational NO-DES Water Main Flushing. All work will be performed according to the Standard Operating Procedures of Attachment 1.

II. TIME FOR PERFORMANCE

ValveTek Utility Services will complete the flushing program within 67 consecutive working days, Monday through Friday – excluding holidays, of being issued the Notice To Proceed

III. COMPENSATION

The proposal cost is based upon the following unit costs:

- Daily Cost to NO-DES Flush = \$4,100.00
- Filter Elements cost per set = \$156.00
- Mobilization/Demobilization One Time Fee = \$1,500.00

The proposed cost is estimated based upon:

- 67 flushing days (101 miles of water at 1.5 miles per day) = \$274,700.00
- The use of 4.2 filter sets per day = \$43,549
- One mobilization/demobilization = \$1,500.00

Proposal Cost = \$319,749.00

It is understood and agreed by the City of Manhattan Beach and ValveTec Utility Services, Inc. that any contract that is executed:

- Will be paid based on a 67 day project length with a not-to-exceed amount of \$319,749; or
- Will be paid according to the daily rated shown under Section III Compensation above.

If the City of Manhattan Beach cancels or reschedules the project within 60 days from the Notice To Proceed date, a Project Scheduling Fee will be imposed in the amount of \$2,500.00.

Invoicing will be conducted on a weekly basis and payment terms are Net 15.

Crew Makeup:

City of Manhattan Beach will appoint one City employee at each location to assist the NO-DES operator for the duration of the flushing project. The City employee(s) and is/are required to secure their own transportation to and from work sites. ValveTek will provide two employees to operate supervise and train the assigned crew. City employees and ValveTec crews are required to adhere to all Standard Operating Procedures of Attachment 1

Equipment:

The NO-DES unit to be used has a maximum pressure rating of 150 psi and is limited to flushing a maximum size water main of 12" in diameter. City of Manhattan Beach personnel will be responsible for selecting the mains to be flushed.

If the NO-DES equipment breaks down, the City of Manhattan Beach will not be charged for that days operational cost. If the flushing crew desires to use blow-off's located at dead-ends, the City will be required to provide the connection mechanisms (stand pipe with adapter to 2-1/2" FT). Any main line valve operations will be performed or supervised by the City of Manhattan Beach.

NO-DES will supply ramps to allow vehicles to cross the hoses that block street access. City of Manhattan Beach flushing crew will supply any additional traffic or safety equipment that is required.

The City of Manhattan Beach will provide all:

- Sodium hypochlorite needed for the duration of the project.
- Adaptors needed to fit fire hydrants having standard 4-1/2", NSF thread ports.

Records:

NO-DES will maintain a record for each flush performed. All records will be submitted to the City of Manhattan Beach Staff from NO-DES after each week of flushing completed.

The City of Manhattan Beach will be responsible for all regulatory reporting requirements. All water quality sampling and testing will be performed by the City of Manhattan Beach crew. NO-DES operations include testing inlet and outlet turbidities, flows and chlorine residuals. The City of Manhattan Beach may choose to perform additional water quality sampling outside the contract requirements.

Filters:

Each filter vessel (two each) requires 12 bags in each vessel of 1 micron *absolute* filter bags. While the length of time the bags will last before needing replacement can vary; we have seen them last anywhere from one flush to over three weeks. NO-DES will provide all of the filter bags, as included in the cost estimate.

Please review our attached NO-DES filter performance statement, as filter bag replacement can vary depending on the condition of your water distribution system; the most important factor being how often the water distribution system has been flushed in the past and how heavily loaded it is at present.

Sincerely,




Jeff Favina
VP of Field Operations
ValveTek Utility Services, Inc.
"Authorized Nationwide Contractor for NO-DES Patented Flushing"
Mobile – 347-739-4674
www.valvetek.net
www.no-des.com

ATTACHMENT 1

NO-DES, Inc.



**NEUTRAL-OUTPUT DISCHARGE ELIMINATION SYSTEM
(NO-DES)**

STANDARD OPERATING PROCEDURES

TRUCK or TRAILER MOUNTED 150 or 275 psi Models

December 24, 2015

Table of Contents

<u>Section</u>	<u>Page</u>
Introduction	3
Equipment Overview	4
1. Disinfection of the NO-DES Unit	8
1.1 Initial Disinfection of the NO-DES Unit	8
1.2 Re-disinfection of the NO-DES Unit	10
2. Burro Forklift Safety Checks	11
2.1 Burro Forklift Safety Procedures	11
3. Flushing Water Distribution Systems	14
3.1 Suggested Pre-Flushing Planning and Procedures	14
3.2 Suggested checks prior to leaving the yard/parking area	14
3.3 Checking disinfectant residual in NO-DES unit prior to use	15
3.4 Upon arrival at the flushing site	15
3.5 Flushing can begin if flow is zero and pressures are stabilized	19
3.6 Creating Extended Loop Operations from One Set-up Location.	22
3.6 First Stage Filter By-Pass Operations	24
3.7 Mid-Flush Filter Element Replacement	24
4. Chlorination System and Disinfection of Distribution System Water	25
4.1 NO-DES chlorination system components	25
4.2 Guidelines for injecting disinfectant	25
4.3 Checking disinfectant residuals for over-night non-use periods	26
4.4 Checking disinfectant residuals during non-use periods for up to 30 days	26
4.5 Preparing NO-DES unit for non-use periods of longer than 30 days	27
5. Large Meter Testing and Calibration Utilizing the NO-DES_Unit	28
5.1 Procedures for utilizing the NO-DES unit during large meter testing	28
6. Utilizing the NO-DES Unit as a Portable Booster Pump	29
6.1 How to use the NO-DES unit as a portable booster pump	29
7. Flushing Water Mains After Completing Repairs	30
7.1 How to use the NO-DES unit to flush water mains after completing repairs	30
8. Replacing/Installing Filter Bags and Cartridges	31
8.1 How to replace filter bags or cartridges	31
9. NO-DES Flow / Velocity chart	32
10. Reporting Errors & Feedback	33

INTRODUCTION

The TRUCK or TRAILER MOUNTED 150 or 275 psi NEUTRAL OUTPUT DISCHARGE ELIMINATION SYSTEM (NO-DES) Water Main Flushing Technology was designed as a solution to replace the wasteful methods of flushing potable drinking water mains thru hydrant flushing programs (conventional or Uni-directional)! The NO-DES system is connected to two hydrants or blow-off's, the hydrants are then opened and the NO-DES unit is pressurized; the NO-DES system becomes a temporary loop in the distribution system, just as a booster pump system does. The NO-DES pump, circulates water at desired flows in the opposite direction of the natural flow of the main being flushed. This stirs up sediment and scours the inside of the main between the two hydrants only. As the water is circulated within the temporary loop by the NO-DES unit it passes through our multi-filtration system, which removes particles down to one micron "absolute" in size, and disinfectant is added.

Scope

This manual is a reference for the **TRUCK or TRAILER MOUNTED 150 or 275 psi NEUTRAL OUTPUT DISCHARGE ELIMINATION SYSTEM (NO-DES)** system equipment operation and maintenance. No Federal, State, County, City, or any governmental regulations, rules, laws, etc. shall be superseded.

Confidentiality

The **TRUCK or TRAILER MOUNTED 150 or 275 psi NEUTRAL OUTPUT DISCHARGE ELIMINATION SYSTEM (NO-DES)** Standard Operating Procedures Safety & Training Manual and various component manuals contain information intended for the exclusive use of the individual or entity to which it is addressed and may contain information that is proprietary, privileged, confidential and/or exempt from disclosure under applicable law. If you are not the intended recipient, you are hereby notified that any viewing, copying, disclosure or distribution of this information may be subject to legal restriction or sanction. Please notify NO-DES, Inc. by email or telephone, of any unintended recipients and destroy the documents without making any copies.

Warranty

The NO-DES Warranty and Guarantee is covered in detail in the purchasing and licensing contract - We guarantee our components, parts and materials against all defects of construction during 12 months from date of commissioning or 16 months from date of supply, whichever is earlier. During this time NO-DES's responsibility will be limited to repair or replacement of elements of admitted constructive defect or damage; with the exception of the hoses and the Fil-Trek filter vessels:

- The hoses have a ten (10) year limited warranty from the manufacture against any defects.
- The Filter Vessels have a two (2) year warranty from the manufacture.

Distribution

1. A Standardized Operating Procedure Guide is also included with each NO-DES unit, and another copy will be issued to the person in charge of the flushing program and responsible for the use of the NO-DES unit.
2. All employees who have been trained in the proper operation of the NO-DES unit and who perform work utilizing it shall be issued a soft copy of these Standard Operating Procedures for their reference.

A. EQUIPMENT OVERVIEW

General Safety Procedures

- **READ THIS SOP AND THE INDIVIDUAL COMPONENT SAFETY MANUALS BEFORE OPERATING THE NO-DES EQUIPMENT!**
- Be sure to read and follow all OSHA, NEMA, USEPA plus local and state regulations pertaining to the operation of this NO-DES flushing equipment.
- Be sure to follow all recommended maintenance procedures outlined in each individual component manual. Maintenance is simple, but must be executed regularly to achieve safe operation, maximum efficiency and long service life.
- The NO-DES unit must be implemented, operated, maintained and repaired only by authorized, trained and qualified personnel.
- Do not operate the NO-DES equipment in excess of its rated capacity or pressures. Operation of this unit in excess of the conditions set forth in this manual will subject the unit to limits which it may not be designed to withstand.
- Limits (pressure, etc..) must always be permanently marked.
- If any of the provisions contained in this SOP (especially concerning safety) do not comply with local, state or federal regulations, the safer provision must be applied.
- The operator is responsible for keeping the NO-DES equipment in safe operating condition. If parts and accessories are not considered to be reliable for safe operation, they must be replaced immediately.
- Keep this SOP and the individual operating manuals available for the operators, and take care that operations and maintenance are performed according to the instructions. Enter all general operating data and maintenance, etc.. in the NO-DES units log book. Observe all relevant safety provisions.
- Failure to follow any of these warning may result in an accident causing personal injury or property damage.

- WARNINGS -

*****The NO-DES unit should be parked in a secure enclosed area when not in use and should never be left unattended when outside that area.**

*****Never operate the water pump without water in the pump (and filter vessels) – The mechanical seal in the pump will be damaged!**

Protection from Freezing Conditions

It is the purchaser's responsibility to take whatever measures necessary to ensure that neither the NO-DES unit nor any of its components are subjected to environments that could lead to the freezing of water within them. The unit must be stored inside, where temperatures can be maintained above freezing. Failure to protect the unit from freezing may result in serious damage to the NO-DES unit and components. If such protection is not possible, all water must be drained from every component when not in use.

*****Do not operate the NO-DES system during freezing conditions, as this may result in severe damage to several components on the NO-DES Unit*****

The following pictures indicate all of the drain valves and lines that need to be purged of water if the unit is to be stored in freezing conditions:

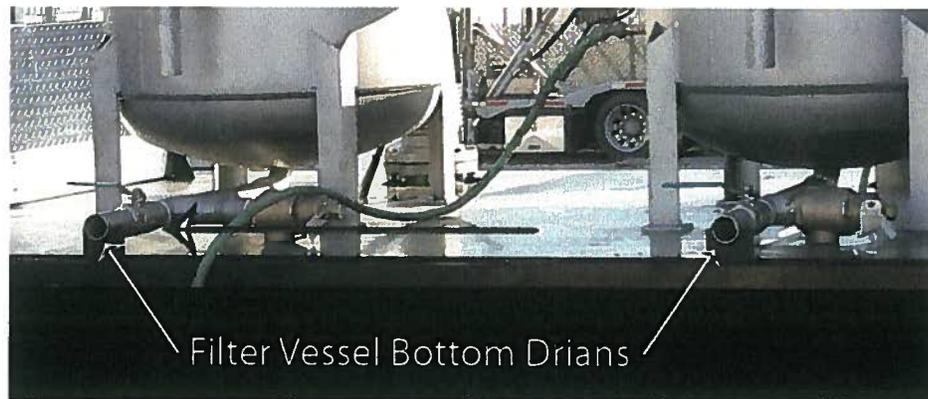


Figure A.1: Drain ports at bottom of filter vessels.

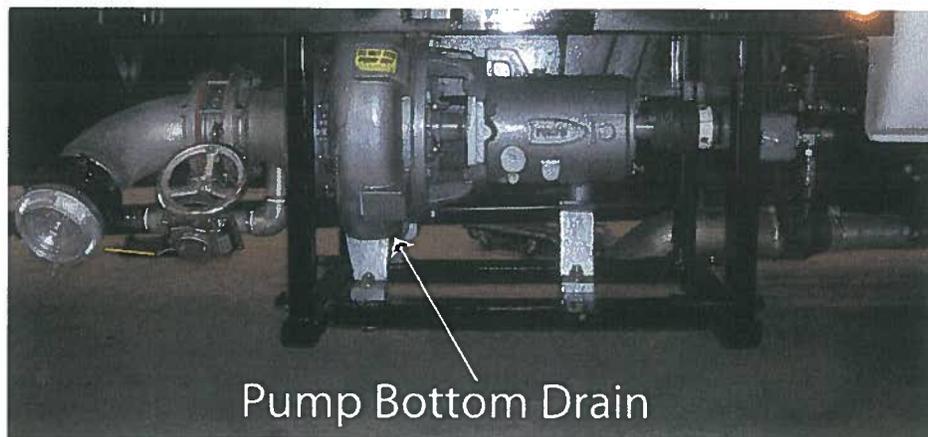


Figure A.2: Pump housing bottom drain port.



Figure A.3: Control panel components that require draining.

1. Inlet pressure and test tap drain.
2. Middle pressure and test tap drain.
3. Outlet pressure and test tap drain.
4. Inlet turbidity meter drain.
5. Outlet turbidity meter drain.

NO-DES UNIT COMPONENTS





Figure A.4: NO-DES Truck Components.

- | | |
|---|--|
| 1. Roughing filter – Stainless Steel 12 elements | 18. Chlorine Injection Quil |
| 2. Flow Meter probe | 19. Chlorine Pump |
| 3. Polishing filter – Stainless Steel 12 elements | 20. Hose Reels |
| 4. Air Release Valves | 21. Chlorinator Timer Switch |
| 5. 5" Storz Outlet Hose Connection Point | 22. Flow Meter – Read Head |
| 6. 5" Storz Inlet Hose Connection Point | 23. Primary Water Pump Tach |
| 7. 6" Check Valve | 24. Filter Head Differential Pressure Gauges |
| 8. Primary Water Pump | 25. Outlet Turbidity Meter |
| 9. 2" Bypass Piping System | 26. Inlet Turbidity Meter |
| 10. 6" Outlet Valve | 27. Turbidity Control Head |
| 11. 6" Inlet Valve | 28. Filter Lid Bolt & Nut |
| 12. Hydraulic PTO Motor | 29. Filter Lid Lifting Arm |
| 13. Fire Extinguisher | 30. 2" Auto Pressure Relief Valves |
| 14. Inverter – 110 vac | 31. Filter Vessel Bottom 2" Drain Valves |
| 15. Hydraulic Tank for PTO | 32. Filter Bag Installer/Plunger |
| 16. 6" Inlet Filter Bypass Valve | 33. 8" Filter Vessel Bridge Connection |
| 17. Chlorinator Tank | |

Section 1 – Disinfection of the NO-DES Unit

1.1 Initial Disinfection of the NO-DES Unit

Disinfect the NO-DES unit upon delivery and after long-term storage, prior to placing the unit into service. The following procedures are derived from ANSI/AWWA Standards C651-05 – Disinfecting Water Mains and C653-03 – Disinfecting Water Treatment Plants.

- a) Fill the NO-DES unit and hoses with water from the potable water system's fire hydrant. Connect the NO-DES unit to the fire hydrant using the hydrant control valves, which connect to either a 2½" or 4½" fire hydrant port. Keep the control valve closed at this point so that the fire hydrant operating valve can be fully opened prior to filling the NO-DES system. This is particularly important when operating "dry barrel" type fire hydrants, as the hydrant operating valve water must be in the full open position in order for it to seal the drain hole in the bottom of the hydrant bury, as it is designed to do.
- b) Disinfect hoses at the same time as the NO-DES unit. When disinfecting hoses and the unit at the same time, connect all NO-DES hoses to each other and loop them from the NO-DES inlet to the NO-DES outlet (see picture below).



Figure 1.1: Hoses looped all together for disinfection.

- c) Spray the threads of all hose ends, control valves, fittings and hydrant ports to be used in the disinfecting process with a 200 mg/L chlorine solution before connecting them.
- d) Once the NO-DES unit is full of water, disconnect the 5" hose from the hydrant, and then connect it to the outlet of the NO-DES unit to form a loop. Use a smaller ¾" or similar-sized hose to then fully pressurize the NO-DES unit and hoses, but first flush and spray disinfectant at connection points, as described in Section 1. a). The picture below illustrates how the hose loop is formed using a 25-foot section of 5-inch hose. Use this same procedure when disinfecting any length of hose. All 1,000 feet of 5" hose and all 400 feet of 2-½ inch hose can be linked together as shown in picture c above, in order to disinfect them all at the same time, thus saving time.



Figure 1.2: Proper disinfection of the NO-DES unit

- e) Once the system is pressurized using the smaller hose, and all air has been vented out of the air releases located on top of the filter vessels, the unit is ready for the addition of liquid chlorine.
- f) The water within this isolated loop of hose and the NO-DES unit is now circulated by the NO-DES pumping system. The water is to be circulated at approximately 200 gpm, which will ensure a thorough mixing of the liquid chlorine once it is injected.
- g) Add liquid chlorine by starting the NO-DES unit's chlorination system and adjusting the dosage to achieve a 25 mg/l residual. Take free chlorine residuals until a free chlorine residual of at least 25 mg/L has been reached. Do not allow the free chlorine residual to exceed 200 mg/L.



Figure 1.3: Bypass piping system

- h) Shut off the chlorinator and allow the water to circulate for 5 additional minutes, then measure the free chlorine residual again. If the free chlorine residual is 25/mg/L or more, take a second free chlorine residual 5 minutes later. During this time, keep the water circulating through the NO-DES unit and loop of hoses.
- i) If either of these two free chlorine residuals is less than 25 mg/L, start up the chlorinator again and add additional chlorine. Repeat the above process until a free chlorine residual of 25 mg/L has been achieved and maintained and measured twice. At that time, you may shut down the NO-DES pumping system. Record the free chlorine residual in the NO-DES log book.

- j) Allow the chlorinated water to stand in the NO-DES unit and hoses for at least 24 hours. At the end of this 24-hour contact time, circulate the chlorinated water above 200 gpm by the NO-DES pumping system for 5 minutes. At the end of the cycle, draw a sample and measure the free chlorine residual. Take an additional free chlorine residual test shall two minutes later to obtain representative samples of the chlorinated water. The free chlorine residual should be no less than 15 mg/L.
- k) If the free chlorine residual is less than 15 mg/L, you must repeat steps 1.1 a) through 1.1 j) of the disinfection process above, by adding additional chlorine until the residual is at or above 25 mg/L, as above.
- l) If the free chlorine residual has not dropped below 15 mg/L, flush the NO-DES hoses and unit to waste with distribution system water through a connection to a fire hydrant, as noted in Section 1.1 a). Continue this flushing until measured residuals of the flushed water is similar to that of the water coming in from the distribution system. Properly neutralize all discharged water as required by regulation or practice by the Utility.
- m) Once completely flushed, reconnect the hoses to the NO-DES unit in a loop as in Section 1.1 d). Circulate the water within the NO-DES unit using the NO-DES circulating pump, and take two bacteriological samples at two-minute intervals, and record them in the log book. Once the samples have been drawn and recorded in the log book, turn off the NO-DES circulating pump and allow the water within the unit and hoses to stand in the unit and its components for at least 24 hours.
- n) At the end of the 24-hour period as noted in step 1.1 m), start the NO-DES circulating pump and take two more bacteriological samples at two-minute intervals, and record them in the log book.
- o) Analyze all the samples taken in steps m) and n) above in accordance with the latest edition of *Standard Methods for the Examination of Water and Wastewater*. If none of the samples shows the presence of coliform bacteria, or a measured HPC count greater than 500 colony-forming units (cfu) per ml, the unit may be placed into service. If any of the samples fail to meet these standards, you must flush the NO-DES unit and hoses and re-sample as above until samples meet the aforementioned standards.
- p) Once the NO-DES unit is disinfected, you may install filter bags and cartridges (see Section 8 – Replacing/Installing Filter Bags and Cartridges). Always use rubber gloves that have been disinfected by a 200 mg/L solution to handle and install the filter bags and cartridges.

1.2 Re-disinfection of the NO-DES Unit

- a) When the NO-DES unit is taken out of service for 30 days or more, you must disinfect it again, as explained in Section 1, Disinfection of the NO-DES Unit. However, if the hoses are properly stored, you do not need to disinfect them. Proper hose storage means that all hoses are stored in a controlled environment, with safety caps on all ends to prevent contamination. You must flush these hoses thoroughly with distribution system water prior to putting them back into service and connecting them to the inlet side of the NO-DES unit.

NOTE: Remove and dispose of filter bags and cartridges when preparing the NO-DES unit for down time of more than 30 days.

Section 2 – Burro Forklift Safety Checks & Operations

2.1 Burro Forklift Safety Checks

1. All employees must complete the NO-DES supplied safety and training course for the Burro forklift, hereinafter referred to as the "forklift," prior to operating it. The Utility must maintain records of this training.
2. Refer to the attached Quality Corporation Forklift Operators Manual for additional information.
3. Check the operation of all hazard/emergency lights.
4. Check all locking devices and tie-down chains prior to any vehicle movement.
5. Ensure that the steering handle is in the upright, locked position, and that the safety pins are installed.
6. **Check and verify that the electrical pigtail is connected to the forklift when trailering it.**
7. **Ensure that the fuel valve is off whenever transporting the Burro.**
8. Operate the forklift hose mule with its hazard lights **on** at all times during operation—day or night.
9. **Connect the hydraulic lines and unpin the reel locking pin to free the reel from the reel frame every time the fork pins are installed.**
10. **Disconnect the hydraulic lines and deploy the reel locking pin to lock the reel to the reel frame every time the fork pins are removed.**
11. Check and verify that the hydraulic quick connects (pigtailed) are connected from reel to forklift prior to hose rolling or un-rolling operation.
12. Check and verify that the trailer reel docking shoe locks are locked prior to any trailer movement.
13. Check and verify that the hydraulic hose connections from reel to forklift are **disconnected** prior to backing up after placing the reels on the trailer.

2.2 Burro Forklift Operations

2.2.1 Dismounting Burro off of the trailer.

1. Remove safety chains from mounting points on trailer /truck (attach to hooks on Burro mast).
2. Remove "trailer to burro" electrical pigtail and store in storage compartment or for temporary storage, wrap around trailer rail.
3. Turn on Burro strobe light.
4. Remove both safety pins and lower the steering control bar.
5. Ensure all hydraulic controls are off or in neutral positions.
6. Turn on (open) fuel valve on Burro.
7. Engage Full Choke on Burro.
8. Start Burro engine, reduce choke immediately upon ignition and warm up engine.
9. Tilt the mast forward, which will lower the front wheels 6 to 8 inches.
10. Flip up the safety latches on the two main mounting arms.
11. Raise the Burro up 6 inches.
12. With your foot, kick or push the mounting arms in, towards the trailer and away from the Burro. (see fig 2.1 - #1)
13. Lower the Burro down next to the ground, but not quite touching the ground.
14. Level the three wheels equally, and then center the forks in the fork slot so that all of the weight of the Burro is off the trailer and on the ground.
15. Back up the Burro away from the trailer.

2.2.2 Mounting Burro onto the trailer.

1. Ensure that the reel shoe locks are in the lock position prior to mounting the Burro to the back of the trailer. You won't be able to reach them once the Burro is piggybacked on the trailer.
2. Remove all loose equipment from the Burro's storage boxes.

3. Ensure that the trailer mounting arms are pushed all the way in towards the trailer. (see fig 2.1 - #1)
4. Line up the Burro to the back of the trailer; center the mast to the middle taillight.
5. Position the forks to the height needed to enter the fork slots on the trailer.
6. Drive forward, ensuring that the forks smoothly enter the fork slots until the Burro mast stops against the trailer.
7. Raise the Burro up until the mast alignment marks are equal.
8. From each side of the Burro, extend the trailer mounting arms out until the seats are directly under the Burro bottom mast tubing. (see fig 2.1 - #1)
9. Lower the Burro until the Burro bottom mast tubing is sitting in the mounting arm seats.
10. Ensure that the swing latches have automatically latched into the locked position.
11. Raise the steering control bar and lock into upright stowed position; install both pins. (see fig 2.1 - #7)
12. Attach safety changes to trailer. (see fig 2.1 - #2)
13. Connect the "trailer to Burro" electrical pigtail.
14. Shut off the fuel valve on the Burro engine. (see fig 2.1 - #6)
15. Remove the key from the Burro ignition.
16. Turn off the strobe light.

2.2.3 Removing hose reels from the trailer.

1. Ensure that the reel docking shoe locks are unpinned.
2. Remove any rubber bungees from hose ends.
3. Ensure there is grease on the face of the forks to facilitate easy sliding of the reels when lining up pin holes!
4. Drive Burro forks into reel fork tubes and lift reel off the trailer by tilting the mast aft. This ensures that the reel does not slide off the forks prior to safety pinning the reel to the forks.
5. Back up Burro approx 10 feet and stop.
6. Insert the fork to reel pins.
7. Lower reel to approx 4 inches off the ground and make sure it is level.
8. Unpin the reel drum locking pin.
9. Remove the rubber bungee holding the hydraulic hoses at the top of the reel; connect the reel's hydraulic hoses to the Burro's hydraulic connections on the mast.

2.2.4 Installing hose reels back onto the trailer.

1. Stop the Burro approx 10 feet behind the open reel shoe (at the back of the trailer) to be loaded.
2. Tilt the mast to the full back position.
3. Install the rubber bungees that hold the hose ends.
4. Disconnect the hydraulic hoses from the Burro and connect them together; install the rubber bungee that holds the hydraulic hoses to the top of the reel.
5. Engage the reel drum locking pin.
6. Remove the reel to the forks' safety pins. This ensures that the reel does not slide off the forks prior to installing it on the trailer.
7. Raise the forks (reel) just above the level of the docking shoe on the trailer.
8. Drive the Burro forward and place the reel into the reel docking shoe.
9. Slowly back up the Burro away from the trailer approx 10 feet (ensuring that nothing is still connected to the reel that can pull it off the trailer/truck).
10. Engage the reel docking shoe pins.

2.2.5 Unrolling hose reel operation.

1. Do not connect the Hose to the NO-DES unit or hydrant until all of the hose is rolled out!
2. Leave a safety cone in the center of every driveway that is blocked by the hose.
3. Ensure that the strobe light is on at all times.
4. Ensure that all tools and fittings are on the Burro prior to the start of hose unrolling operation.
5. Ensure that the reel's hydraulic hoses are connected to the Burros hydraulic connections on the mast.
6. Ensure that the reel drum locking pin is unpinned prior to turning the drum with hydraulics.

7. With the NO-DES unit, at a standstill, start unrolling the hose while the assistant carries the hose end 5 feet past the connection point on the No-DES unit.
8. With the assistant still holding the hose end, start unrolling the drum and driving the Burro backwards, keeping the hose semi-taut. Have the assistant stand on the hose until enough hose is out to keep the hose from dragging.
9. **If the hose run is laid over a higher elevation than that of the hydrant and NO-DES unit, or if the hose run has a high point that will trap air:** Install the air release valve fitting near the highest point in the hose run; only.
10. **If using more than one reel of hose, and once the reel is empty:** determine where the starting point will be for rolling the hose back up, and pre-position the empty reel at that location.
11. After the hose is laid up to the hydrant, position the Burro as a blocking safety barrier to the hose extending out into the street. Leave the strobe light on!

2.2.6 Rolling hose reel operation.

1. Always roll up the hose from the highest point.
2. Ensure that strobe light is on at all times.
3. Ensure that the reel's hydraulic hoses are connected to the Burros hydraulic connections on the mast.
4. Ensure that the reel drum locking pin is unpinned prior to turning the drum with hydraulics.
5. Ensure that the hose end at the lowest point is open and clear to drain – make sure that it is not folded or twisted.
6. Always spray disinfectant inside the open end of the hose prior to connecting. Connect the hose end to the cap located inside the reel drum.
7. Start the drum turning and use the forward movement of the Burro to maintain the hose taut -- do not drag the hose.
8. Maintain the rolled lengths of hose at the sides of the reel drum while rolling; always place the knuckles in the center.
9. Never allow the assistant to get closer than five feet to the reel drum.

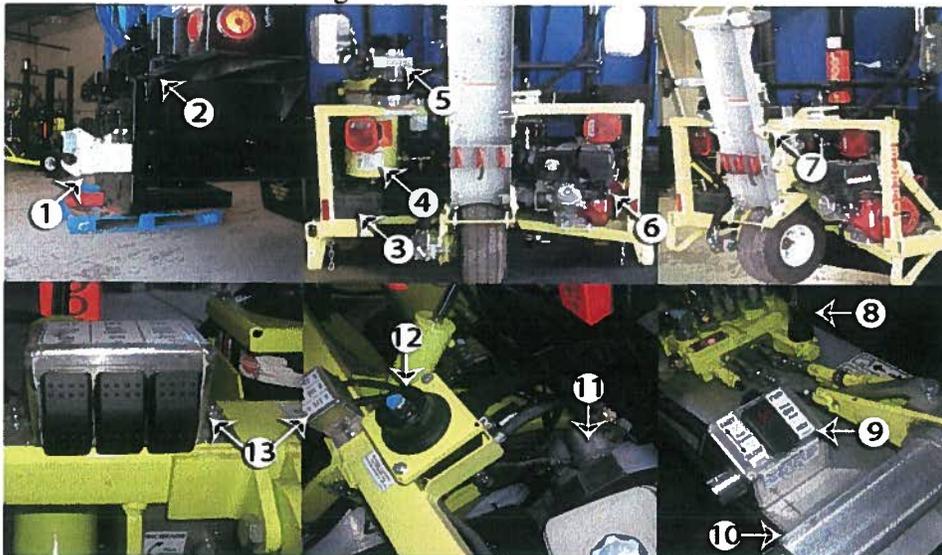


Figure 2.1: Burro components and controls.

- | | |
|---------------------------|---------------------|
| 1. Burro Mounting Bracket | 8. Mast Tilt Lever |
| 2. Safety Chain Mount | 9. Reel Controls |
| 3. Burro Battery | 10. Fork Controls |
| 4. Hydraulic Reservoir | 11. Hyd Pumps |
| 5. Hyd Control Valve | 12. Hyd Accumulator |

6. Fuel Valve
7. Safety Pin

13. Light Switches

Section 3 – Flushing Water Distribution Systems

3.1 Suggested Pre-Flushing Planning and Procedures

- a) Review records and maps for the area to be flushed, and determine the best approach to flushing.
- b) Check for special memoranda or notices from other departments for conflicts during holidays, area pump station operations, community events or other circumstances that may affect the flushing operation or the distribution system in an undesired or adverse manner.
- c) Brief flushing crews about the area to be flushed that day and shift, and confirm and coordinate the scheduled work: Post **No Parking** signs, door hangers, hydrant prepping, etc.
- d) Where applicable, ensure that city, county, state or other agencies, customers, schools, hospitals or businesses have been notified of the proposed flushing schedule.
- e) Notify customers of planned flushing through various means, such as in their monthly bills, email, or newspaper notices.
- f) Coordinate and schedule any required or desired water quality sampling.
- g) Perform an inspection of the NO-DES unit at the beginning of every day or shift to ensure that all systems are ready for use.

3.2 Suggested checks prior to leaving the parking area:

a. Check to ensure the proper tools and equipment are on the unit:

- NO-DES log book
- Flushing data sheets
- Distribution maps/sheets
- Filter cartridges and bags
- Chlorine
- Chlorine residual analyzer
- Sample bottles
- Hoses and safety caps
- Hose repair equipment and parts (if applicable)
- Hose ramps
- Special adaptors (for hydrants, blow-offs etc.)
- Valve operating keys and tools to remove valve covers
- Disinfectant spray bottle
- Batteries and adapter cords for radios
- Lube oils
- Timer or watch
- Safety equipment such as ear plugs, glasses, vests, gloves and hard hats

b. Check fluid levels and battery charge and perform operational function checks of NO-DES components prior to departing the parking area:

- Check truck engine fluids and levels.
- Check the hydraulic pump's fluid tank level.
- Ensure that the fuel valve is **always** off when transporting the forklift.
- Check to ensure that all safety caps are installed on all hoses and accessories. Check inventory of all adapter fittings and couplings.
- Verify that correct filter cartridges and bags are installed per Section 3.2.
- Drain each filter sand drain (located at the bottom of each filter vessel) until water runs clear.
- Check all tie-down straps and safety chains, and secure all loose equipment in preparation for driving conditions.

3.3 Checking disinfectant residual in NO-DES unit prior to use:

Prior to the first flush of the day and after the end of the last flush of the day, test the water left in the NO-DES unit to verify that it has a chlorine residual within an acceptable range.

If chlorine is used as the distribution system disinfectant and the residual is below acceptable levels – add the prescribed amount of chlorine needed to attain the desired residual.

If chloramine is used as the distribution system disinfectant and the residual is below acceptable levels - Measure free ammonia levels and determine how much chlorine must be added to reform chloramines and bring chloramine residuals to within acceptable levels.

To adjust the chlorine residual levels: Open the circulation bypass valve (as shown below), start the NO-DES circulating pump and add the appropriate amount of disinfectant, utilizing the NO-DES chlorination system, as described in Sections 1.1g-l.



Figure 3.1: Bypass piping system

3.4 Upon arrival at the flushing site

- a) Ensure that the incline of the street does not exceed the forklift limitations as listed in the Burro forklift owner's manual.
- b) Wear safety vests and hard hats at all times when flushing with the NO-DES unit.
- c) Follow proper setup procedures, including safety signage, ramps, cones and barricades.
- d) Confirm that you are at the correct starting point for the flushing operation.
- e) Determine and verify the normal direction of flow in the water distribution system where possible. This will determine which hydrant will be the inlet or outlet for the NO-DES flushing procedure (see diagram below). The inlet should be the long-side hose.

NO-DES, Reverse Flow Method

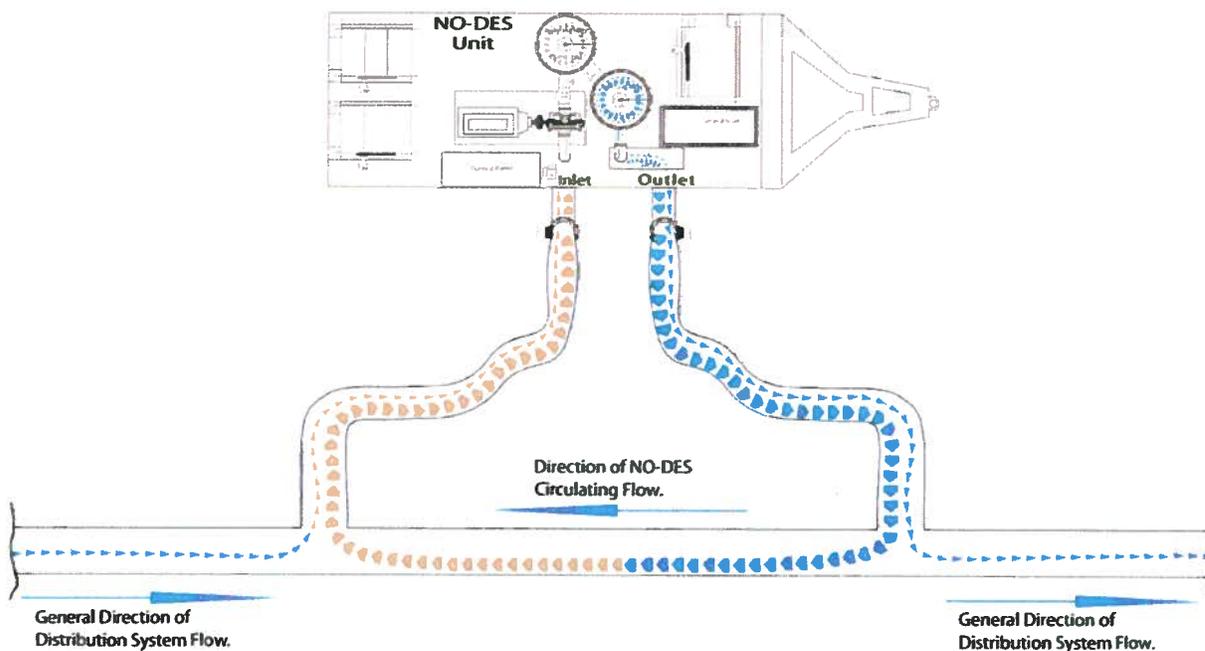


Figure 3.2: NO-DES Reverse Flow Method

- f) Remove appropriate hydrant port caps and spray a liberal amount of disinfectant inside each hydrant and around port threads.
- g) Coordinate with the forklift operator and lay out appropriate lengths of hose. Install cones and barricades to protect the hose.
- h) Spray a liberal amount of disinfectant inside and outside of each coupling prior to connecting the hoses to the hydrants, the NO-DES unit or to other hoses. Keep to the same side of the street until you are required to cross to connect with the hydrant.
- i) Check each hose storz coupling on the hoses that are rolled out, to ensure the latches are secure.
- j) Check and verify that there are NO kinks in the hoses!
- k) Record the approximate distance between hydrants to be flushed, if tasked to do so by your utility management.
- l) Always check the condition of the hoses while rolling and unrolling. (See Section 2.2 for proper rolling and unrolling procedure.) Replace any hose that is damaged and unusable. A leaking hose has a potential for contamination. Ensure safety caps are installed on open ends of hoses at all times when not in use! Always check all hose couplings to ensure they are fully locked in the connected position.
- m) Set up hose ramps and associated signage as needed.
- n) At the NO-DES unit, remove the 5" protective storz cap from the inlet connection point and, if the unit is full of water, open the 6" inlet valve to perform a function check of the inlet **check valve** operation. If water continues to drain from the vessels, the check valve has failed. **DO NOT OPERATE THE NO-DES UNIT. CONTACT NO-DES TO HAVE THE CHECK VALVE REPLACED.**

- o) Remove hydrant caps and slowly, partially open the hydrant and burp waste to atmosphere approximately 20-30 gallons of water to remove any particulate matter, discolored water, etc. from the inside of the hydrant lead, barrel and port(s). This is referred to as "burping" the hydrant. After burping, turn the hydrant valve off and spray a liberal amount of disinfectant inside and outside of each coupling prior to connecting to hydrants, the NO-DES unit or other hoses.
- p) Use the 2½ inch x 2 ½ inch x 4 ½ inch "Y" adapter (as shown in Figure 3.4.1, below) if the hydrant has only the 2 ½ inch ports. Spray a liberal amount of disinfectant inside of adapters.



Figure 3.3: The "Y" adapter

- q) Attach the hydrant control valves (and ell's if needed) - ensure that they are closed—one for each hydrant port. Spray a liberal amount of disinfectant inside and around the outside of the opened ports of the control valves.
- r) Always check the unused hydrant caps for tightness prior to opening the hydrant.
 - Open each hydrant to the full open position. The hydrant valve that you installed in "task q" above, will prevent any water from filling the hoses. Open the bled valve (located on the hydrant control valve, (as indicated in Figure 3.4, below) to remove all air trapped in the hydrant.
NOTE: If the hydrant is a dry barrel type, you may see water escaping from around the base of the hydrant if you have not fully opened the operating nut/stem of the hydrant. This type of hydrant is designed to seal at the full open position only.



Figure 3.4: Bled valve and hydrant control valve

- s) Remove the hose safety caps and spray disinfectant inside the ends of each hose and connection fitting and immediately connect the hose to the hydrant control valve. Do not allow contamination of the hoses and hydrants by the entry of foreign matter such as standing water, dirt, leaves, dust or litter.
- t) **Do not connect any hose to the forklift-driven hydraulic hose reel system while the hose is connected to the hydrant, as this could result in serious damage to the hydrant, hoses, forklift and/or water system piping.**
- u) Do not ever drag hoses.
- v) Ensure that both the inlet and outlet valves on the NO-DES unit are closed.
- w) Slightly open the outlet hydrant control valve to 20 to 40 gpm, and slowly fill the hose that is connected to the outlet connection of the NO-DES unit, until all air is vented from the air release ports located just below the outlet valve on the NO-DES unit and also on the hydrant control valve.
- x) Once the outlet hose is pressurized and all air is bled off, slowly open the 6" outlet valve on the NO-DES unit for a function check of the outlet **check valve operation**.

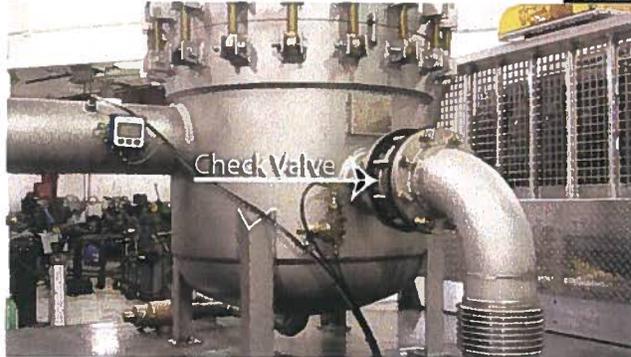


Figure 3.5: Check Valve.

You should hear a clunk, which indicates the check valve has seated. If air is venting from the air releases located on top of the filter vessels, the check valve has failed. **DO NOT OPERATE THE NO-DES UNIT. CONTACT NO-DES TO HAVE THE CHECK VALVE REPLACED.**



Figure 3.6: Air release ports

- y) After connecting the hose to the inlet side of the NO-DES unit, close the 6" inlet valve on the NO-DES unit. Open the air release ports located on the hydrant control valve and on the inlet of the NO-DES unit. Slightly open the inlet hydrant valve to 20 to 40 gpm, and slowly fill the hose. Close the air release ports once all air has been vented and fully pressurize the hose.

- z) Open the 6" inlet valve on the NO-DES unit until all air is vented out of the air releases located on top of the filter vessels.
 - **NOTE:** If the pressure relief valve that is installed on each of the filters starts venting water, close both hydrant valves. Install a gauge on one of the hydrants and check the distribution system pressure. If the pressure exceeds the psig rating of the NO-DES model that you are operating, you cannot use that specific pressure rated NO-DES unit.

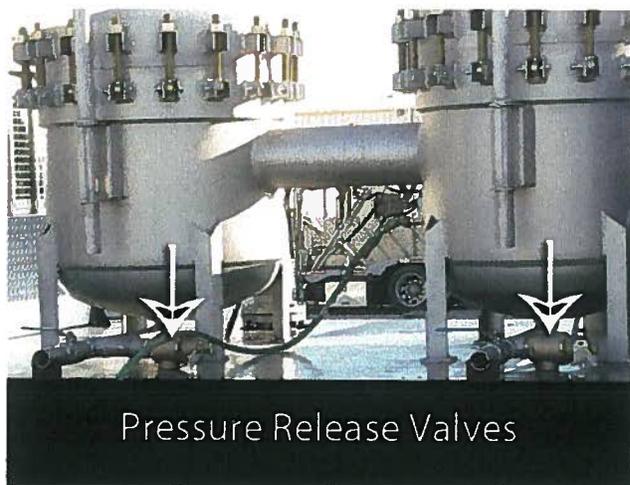


Figure 3.7: Pressure Relief Valves.

- aa) Open the test taps located on the control panel of the NO-DES unit to purge air from the pressure gauge and test tap tubing. Bleed air from the top of the pump casing.
- bb) Close the 6" filter by-pass valve (figure 3.10 on page 21) for normal operation.
- cc) Turn on the feed lines for the turbidity meters and adjust the flows as required.
- dd) Once air is purged from the NO-DES unit and pressure has equalized, open both hydrant control valves previously installed on the hydrants in Step "q" above to the **full open position**.
 - **NOTE:** If after both hydrants are fully opened, and the inlet pressure on the NO-DES Unit is less than the outlet pressure, you have either connected to two different pressure zones in the same distribution system, or you have interconnected two different water distribution systems. Do not attempt to flush! Disconnect the unit and report your findings to your supervisor and record this information in the NO-DES log book.
 - **NOTE:** If, after both hydrants are fully opened, the flow meter indicates a significant flow, you have either connected to two different pressure zones in the same distribution system, or you have connected to two different water distribution systems as a "cross connection." Disconnect the unit and report your findings to your supervisor and record this information in the NO-DES log book.

3.5 Begin flushing if flow is zero and pressures are stabilized

- a) Test and record the distribution system disinfectant residuals, turbidity level, static pressure, and current time in the NO-DES log book.
- b) Start the pump engine (on the trailer unit) or start the truck engine.
- c) On the truck model, engage the Power Take Off (PTO) and turn on the 110 volt inverter. Refer to the truck's owner's manual for more detailed procedures for the PTO.
- d) On the trailer model engage the clutch to start the pump.

- e) Monitor and record the influent and effluent turbidity, disinfectant residual and filter pressure readings at the beginning and end of each flushing cycle, and periodically during long flushing runs.
- f) Monitor the gpm flow rate on the control panel flow meter and adjust the RPM and gpm flow rate until it has reached the desired level.
- g) Reference your system drawing sheet for the size of the main, then reference the flow chart placard (located on the pump control panel and on page 29 of this manual) to achieve the desired velocity inside the water main.
 - **NOTE:** If outlet pressure reading for the second filter vessel immediately increases to or near your "not to exceed" psig system pressure maximum rating, **STOP THE PUMP IMMEDIATELY**, and investigate why (this high pressure could damage plumbing inside the homes of your customers). You have possibly left a valve closed on the unit or a hydrant control valve; or one of the hydrants might have been accidentally left closed or there could be a closed main line valve between the two hydrants. There also could be a significantly higher pressure increase if using the Y connectors at the hydrants.
 - **NOTE:** If you cannot achieve the desired flow rate and the filter vessel differentials are within limits, check both of the hydrant control valves, the hydrant valves and the inlet/outlet valves on the NO-DES unit. If the situation continues, check for a partially closed main line hydrant valve located on the hydrant run for the two hydrants. Other causes could be the use of the Y adapters at the hydrants, or kinks in the hoses.
 - **NOTE:** Fil-Trek, the filter manufacturer, recommends that filter cartridges or bags be replaced when a pressure differential of 20 pounds per square inch (psi) gauge differential pressures are observed. See Fil-Trek Operating Manual for more detailed information on the filter vessels and elements.
- h) Start the chlorinator timer and dial to the time for the chlorinator to run. See Section 1 for detailed information on disinfection and re-disinfection. Check the illumination of the chlorinator strobe located directly to the right of the chlorinator timer.

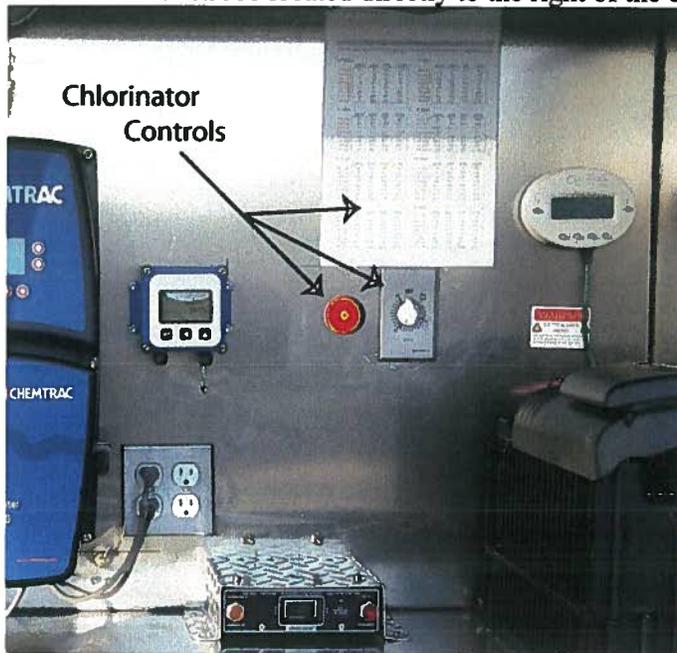


Figure 3.8: Chlorinator Controls

- **NOTE:** The purchaser must correct the chlorine dosage placard located on the control panel to reflect any changes in the disinfectant concentration being used.

- i) Adjust the turbidity feed needle valves for the correct flow into both of the turbidity analyzers.
 - **NOTE:** Turbidity meters should be calibrated monthly (see manufacturer's manual).
- j) Stop the flushing cycle when:
 1. the inlet turbidity is at or below **1.0 Nephelometric Turbidity Units (NTU)**, and
 2. you are satisfied with the disinfectant residual.
 - **NOTE:** If high turbidity levels on the inlet turbidity meter (1st turbidity meter) do not begin to drop significantly after 10 minutes, check for air bubbles in the turbidity meter de-bubbler mechanism.
 - **NOTE:** There may still be a main line valve in the closed position and the flushing run is possibly encompassing a much larger loop of the distribution system. Check for a closed main line valve located between the two hydrants, and check the plat sheet to ensure you are at the correct flushing location. The hydrants that you are connected to may not be located off the same water main. These longer flushing runs can last more than 10 minutes, depending on the length of run, amount of biofilm, corrosion, sediment, and iron or manganese deposits.
 - **NOTE:** If the inlet turbidity analyzer reading does not drop below 1.0 NTU after 10 to 15 minutes, you could have also misidentified the general direction of flow in that section of your distribution system. After confirming that this might be a possibility, shut down the NO-DES unit and reverse the inlet and outlet connections at the NO-DES unit, and start the flushing process again. Record this information in the NO-DES log book for future use.
- k) Disengage clutch or PTO and shut off the pump engine.
- l) Shut off the inverters.
- m) Shut off the feed water to the turbidity meters.
- n) Close both hydrants—full off.
- o) Close both hydrant valves connected to the NO-DES outlet, and relieve the pressure remaining in the NO-DES unit hoses, from pressure relief ports.

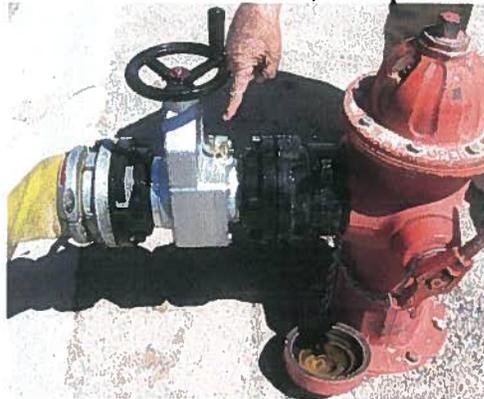


Figure 3.9: Bled valve and hydrant control valve.

- p) Record the required end of flush information in the NO-DES log book.
- q) Make note of any main line valves that were found closed and document any other conditions the operator encountered.
- r) Disconnect and roll up all the hoses. (See Section 2.2 for detailed information on rolling hoses.) Spray disinfectant in the ends and install the hose safety caps, and either place the reels back on the trailer or set up the hoses for the next flushing cycle. Replace the hydrant safety caps and note any maintenance needs for the hydrants or any part of the distribution system that have been observed.
- s) Move safety signage, cones and barriers to the next location and reposition the NO-DES unit for the next flushing cycle.

3.6 Creating Extended Loop Operations from One Set-up Location.

When pre-planning flushing sites, you can choose areas that will allow valving to create multiple loops of new sections of main to be flushed from one set-up location!

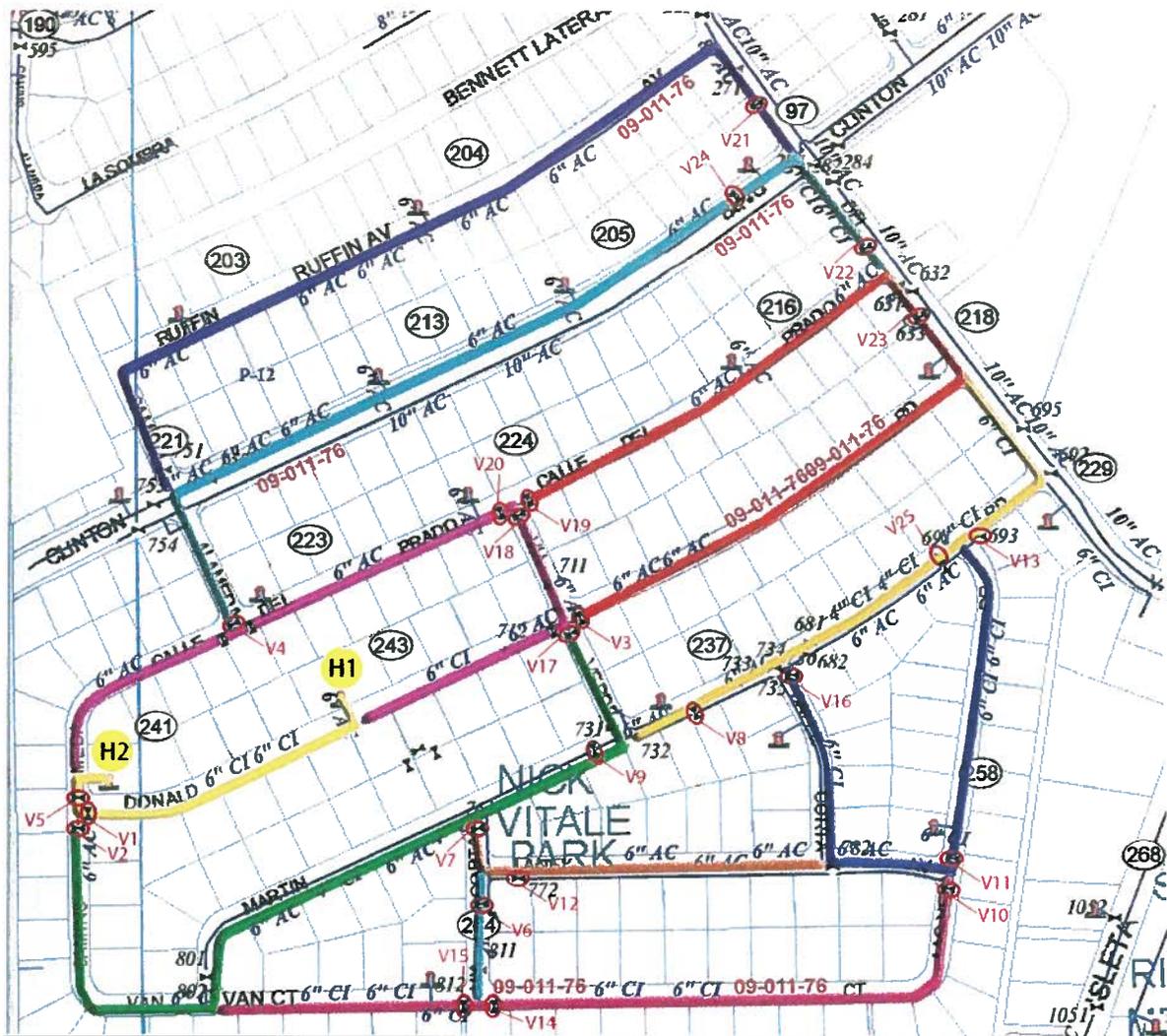


Figure 3.10: Samples of creating extended loops.

- a) See Figure 3.10 Above.
- b) **First flush (bright yellow)** – Set up between H1 & H2 on Donald, approx 800' directly between hydrants.
- c) **Second flush (purple)** – Same set up location between H1 & H2 on Donald – but flushing approx 2,400' on Calle Del Prado & Via Verde & Donald – Close valves #1, #2, #4, #19 & #17
- d) **Third flush (red)** – Same set up location between H1 & H2 on Donald – but flushing approx 2,800' on Calle Del Prado & Via Verde & Donald – Open valves #19 - Close valves #17 & #18 - Leave valves #1, #2, #4 & #17 Closed. Note: Only the red section of this flush is counted as newly flushed main!

- e) **Forth flush (Green)** – Same set up location between H1 & H2 on Donald – but flushing approx 2,600' on Martin & Via Verde & Donald – Open valves #2 & #17 - Close valves #3, #8, #15 & #20 - Leave valves #1, #4 & #18 Closed. Note: Only the green section of this flush is counted as newly flushed main!
- f) **Forth flush (dark yellow)** – Same set up location between H1 & H2 on Donald – but flushing approx 1,600' on Camino Del Valle & Martin – Open valves #3 & #8 - Close valves #7, #11, #16 & #17 - Leave valves #1, #4, #15, #18 & #20 Closed. Only the dark yellow section of this flush is counted as newly flushed main!
- g) **Fifth flush (blue)** – Same set up location between H1 & H2 on Donald – but flushing approx 1,600' on Las Vegas Dr & Ashley & Calle Corta – Open Valve #11 & #16 - Close valves #25 - Leave valves #1, #4, #7, #15, #17, #18 & #20 Closed. Only the blue section of this flush is counted as newly flushed main!
- h) **Sixth flush (Orange)** – Same set up location between H1 & H2 on Donald – but flushing approx 1,000' on Ashley & Via Corta – Open Valve #7 & #11 - Close valves #10 & #16 - Leave valves #1, #4, #15, #17, #18, #20 & #25 Closed. Only the orange section of this flush is counted as newly flushed main!
- i) **Seventh flush (pink)** – Same set up location between H1 & H2 on Donald – but flushing approx 2,300' on Van Ct & Las Vegas – Open Valve #10, & #15 - Close valves #7 & #12 - Leave valves #1, #4, #16, #17, #18, #20 & #25 Closed. Only the pink section of this flush is counted as newly flushed main!
- j) **Eighth flush (light blue)** – Same set up location between H1 & H2 on Donald – but flushing approx 300' on Via Corta – Open Valve #12 - Close valves #10 - Leave valves #1, #4, #7, #16, #17, #18, #20 & #25 Closed. Only the light blue section of this flush is counted as newly flushed main!
- k) **Ninth flush (light blue) up on Clinton** – Same set up location between H1 & H2 on Donald – but flushing approx 3,200' on Clinton & Alameda & Camino Del Valle – Open Valves #4, #7, #10, #16, & #25 - Close valves #2, #13 & #21 - Leave valves #1, #17, #18 & #20 Closed. Only the light blue section of this flush is counted as newly flushed main!
- l) **Tenth flush (dark blue) up on Ruffin Av** – Same set up location between H1 & H2 on Donald – but flushing approx 3,200' on Ruffin & Alameda & Camino Del Valle – Open Valves #21 - Close valves #24 - Leave valves #1, #2, #13, #17, #18 & #20 Closed. Only the dark blue section of this flush is counted as newly flushed main!
- m) Total of 21,800 feet of main NO-DES flushed from one location (set up)! = 4.13 miles of main NO-DES Flushed (one set up, one day)

3.7 First Stage Filter By-Pass Operations

In the event that the first stage filter vessel pressure differential readings reach 20 psig in mid-flush (and the flush is not complete), you can open the 6" first stage filter by-pass valve (figure 3.10) to continue the flush at the required rate.

- n) When the first stage filter vessel pressure differential readings reach or exceed 20 psig during a flushing run (because of filter loading) and the flushing run is not complete, you can open the 6" filter by-pass valve (while the pump is still engaged and pumping) to allow the flow directly into the second stage; allowing you to finish the flush. Figure 3.10
- o) If you are flushing a larger main and need a higher flow – You can also open the by-pass to create up to 200 gpm more flow.

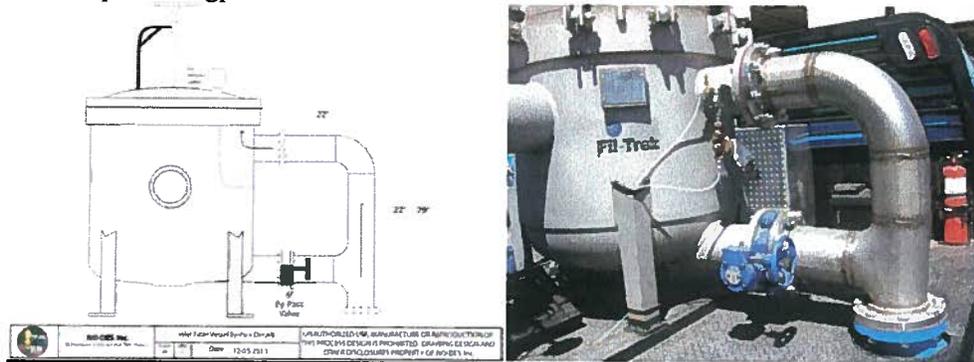


Figure 3.11: By-pass valve on first stage filter.

3.8 Mid-Flush Filter Element Replacement

In the event that filter vessel pressure differential readings reach 20 psig in mid-flush, you will need to stop the flushing process and perform the element replacement; but you cannot stop the flushing process until the sediment that has been stirred-up has been removed.

- p) When the filter vessel pressure differential readings reach 20 psig or more, the flow will decrease somewhat automatically without reducing pump RPM (because of filter loading). At this time, reduce pump RPM until the pressure differential readings are below 20 psig and the flow is between 50 and 150 GPM.
- q) Allow the filtering process to continue at this low flow condition until the NTU's drop below the desired standard.
- r) The operator should roughly estimate the volume of water contained inside the section of main being flushed, in addition to the volume of water contained in the NO-DES equipment, to estimate the time needed to complete one complete pass through the entire loop; this ensures that all stirred-up sediment is removed prior to shutting down. Example: A 500' section of 6" main + NO-DES equipment = approx 1,400 gallons, divided by 100 GPM = 14 minutes.
- s) Once the NTU's are at or below the desired standards, shut down and perform the element replacement (as detailed in Section 8 of this SOP).
- t) Once the elements are replaced, continue the interrupted flush (with the desired high flows) until complete.

Section 4 - Chlorination System and Disinfection of Distribution System Water

- **NOTE: Disinfectant must be injected whenever the NO-DES system is employed.**

4.1 NO-DES chlorination system components

- a) A seven-gallon chemical tank, with drain
 - b) A variable speed chemical feed pump, capable of 150 psig
 - c) A removable chemical injection nozzle
 - d) A positive fail off timer mechanism with a bright red strobe light indicator at the control panel
- The chlorinator timer automatically activates the chemical feed injector and the associated red strobe. Both will shut off automatically when the time has run out.

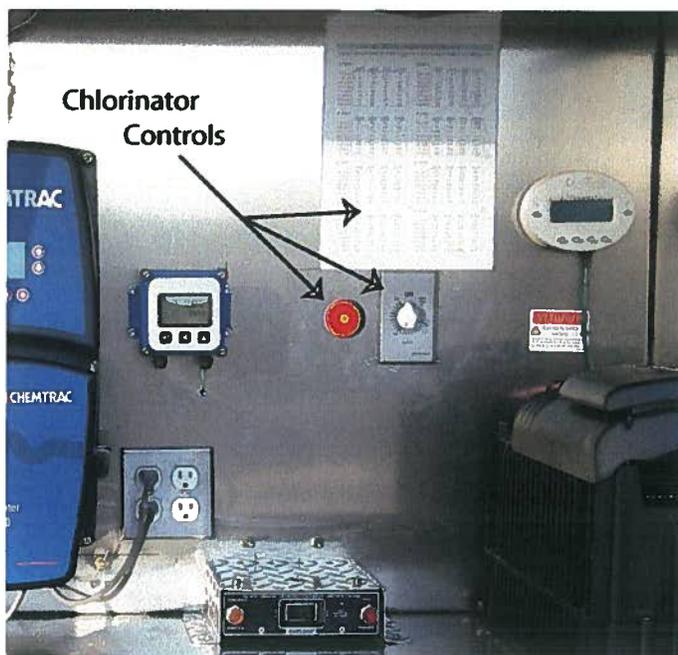


Figure 4.1: Chlorinator Controls.

- e) The chlorine dosage placard located next to the chlorinator controls on the control panel provides guidance for approximating the needed concentrations of chlorine, predicated on the estimated length of the flushing run to be flushed. All placard time estimates are purposely conservative, low dosages, and do not take into account any demand or possible conversion to chloramines due to any free ammonia that might be present in a chloraminated distribution system.
 - **NOTE:** It is the responsibility of the utility and its personnel to check and re-check the residuals to ensure that the desired dosage is applied.
 - **NOTE:** The chlorinator operation can be stopped at any time by turning the timer switch counter clockwise to the off position.

4.2 Guidelines for injecting disinfectant

- a) If possible or applicable, use the same liquid disinfectant that is being used for the source water from your water treatment plant or well stations.

- b) Refer to the Disinfectant Dosing Placard (located on the pump control panel) for the approximate dosage required for your size and length of water main to be flushed. The placard will approximate the lengths of water main and hose, as a quick reference or estimate only. Exact calculations and settings are the responsibility of the water utility and their operators, who may take other demand factors into consideration.
- c) Set the timer per Section 4.2 b) above and observe the red flashing strobe to ensure operation is being performed.
- d) If the disinfectant residual does not increase to the desired level after you have applied the maximum amount per the placard **Stop Dosing Immediately**. Check the operation of the injector pump. If the injector pump is functioning properly, you could be in a situation as described in section 3.4 f) above, namely, you may be connected to and **dosing a different section of main, one that you are unknowingly not monitoring**. **This could also be an indication of a large chlorine demand.**

4.3 Checking disinfectant residuals for overnight non-use periods

- a) At the end of the last flush of the day, test and verify that the water left in the NO-DES unit has a chlorine residual similar to that of the distribution system water. Refer to Section 3.3 for the correct testing procedure to verify chlorine residual levels.
- b) Prior to the next day's first flush, test and verify that the chlorine residual of the water in the NO-DES unit is within an acceptable range of the distribution system water.
- c) If the residual is below acceptable levels, also measure free ammonia levels and determine how much chlorine must be added to reform chloramines and bring chlorine residuals to within acceptable levels. To achieve this, open the bypass valve (as shown in Figure 4.3.1, below), start the NO-DES circulating pump and add the appropriate amount of disinfectant, utilizing the NO-DES chlorination system, as detailed in Section 3.3.



Figure 4.2: Bypass piping system.

4.4 Checking disinfectant residuals during non-use periods for up to 30 days

- a) At the end of the last flush of the day, test and verify that the water left in the NO-DES unit has a chlorine residual similar to that of the distribution system water.
- b) If the NO-DES unit is to be out of operation for 30 days or less, the unit should be maintained full of system water. Filter cartridges and bags can remain installed.
- c) Test and verify chlorine residuals at least 4 times per week to ensure that adequate levels are maintained at all times. Also test free ammonia levels at the same time.
- d) If the chlorine residual is below acceptable levels, determine how much chlorine must be added to reform chloramines, based on free ammonia levels, and bring chlorine residuals to within acceptable levels. To achieve this, open the bypass valve (as shown in Figure 4.2), start the NO-DES circulating pump and add the appropriate amount of disinfectant, utilizing the NO-DES chlorination system.

4.5 Preparing NO-DES unit for non-use periods of longer than 30 days

- a) Drain all water from every component on the NO-DES unit, including the pump, the chemical feed pump and tank, all feed lines and the turbidity analyzers.
- b) Remove all filter cartridges and bags.



Figure 4.3: Filter Cartridges.

- c) Ensure that all drain valves are closed. The unit must remain sealed with the inlet and outlet caps on at all times.
- d) It is highly recommended that the NO-DES unit be parked in a secure enclosed area when not in use and never be left unattended when outside that area.

Section 5 - Large Meter Testing and Calibration Utilizing the NO-DES Unit

The NO-DES flushing system can be used to save water during large meter testing and calibration.

5.1 Procedures for utilizing the NO-DES flushing system during large meter testing and repairs

- a. Determine the size of hose needed: 2-½" or 5". If the test port is 2" or smaller, use the 2-½" hose; if the test port is 4" or larger use the 5" hose.
- b. Connect the NO-DES inlet hose to the riser on the outlet side of the meter being tested. Spray a liberal amount of disinfectant inside and around the outside of the opened ports.
- c. Connect the NO-DES outlet hose to the nearest hydrant, or a blow-off, if it is capable of meeting test flow requirements. Spray a liberal amount of disinfectant inside and around the outside of the opened ports.
- d. **Coordinate the flow needed with the meter mechanic and follow the normal flushing procedures listed in Section 3: Flushing Water Distribution Systems, beginning on page 13.** The flow meter located on the NO-DES unit can be used to back up calibration of the meter being tested.

Section 6 - Utilizing the NO-DES Unit as a Portable Booster Pump

The NO-DES flushing system can be used as a portable booster pumping unit with the added capability of filtering and adding disinfectants to the water.

6.1 How to use the NO-DES unit as a portable booster pump

- a. Determine the size of hose needed: 2-½" or 5". If the connection port is 2" or smaller, use the 2-½" hose; if the connection port is 4" or larger use the 5" hose.
- b. Connect the NO-DES inlet hose to the hydrant or blow-off that will supply water to the pumping unit. Spray a liberal amount of disinfectant inside and around the outside of the opened ports.
- c. Connect the NO-DES outlet hose to the hydrant or blow-off that will supply water to the intended area. Spray a liberal amount of disinfectant inside and around the outside of the opened ports.
- e. Start pumping into the intended area, monitoring the outlet pressures at all times.
- f. Follow the normal flushing procedures listed in Section 3, beginning on page 13.

Section 7 - Flushing Water Mains After Completing Repairs

The NO-DES flushing system can be used to save water and help ensure its quality when used subsequent to completing water main repairs.

7.1 How to use the NO-DES unit to flush water mains after completing repairs

- a. Determine the size of hose needed: 2½" or 5". If the connection port is 2½" or smaller, use the 2½" hose. If the connection port is 4" or larger use the 5" hose.
- b. Connect the NO-DES inlet hose to the closest hydrants located on each side of the main repair. Spray a liberal amount of disinfectant inside and around the outside of the opened ports.
- c. Follow the normal flushing procedures listed in Section 3, beginning on page 13.

Section 8 –Replacing/Installing Filter Bags and Cartridges

The Fil-Trek 1-micron absolute bags and cartridges have a maximum filter vessel inlet/outlet differential head pressure of 20 psi gauge. **This maximum pressure limitation must be strictly adhered to; exceeding the maximum limit could cause unintentional break-through and void the warranty on the bags and cartridges and compromise water quality. Fil-Trek recommends that elements should be replaced @ 15-20 PSI D dirty.**

See the Fil-Trek Operating Manual for more detailed information on the filter vessels, bags and cartridges.

- WARNING -

Do not change out NO-DES unit filter bags or cartridges in the rain or under conditions that could lead to contamination, such as heavy winds or dusty environments.

8.1 How to replace filter bags or cartridges

- Turn off the NO-DES unit’s source of power to the pump: Power Take-Off “PTO” or diesel engine.
- Close both inlet and outlet valves on the NO-DES unit. Hoses can be left charges!
- Open taps to relieve filter vessel pressure. Check all pressure gauges to confirm that pressure is fully relieved to 0 psi pressure readings, and completely drain vessels.
- Remove all filter vessel bolt clamps, and open the filter vessel hatch. Limit exposure time with lid off. Spray a liberal amount of disinfectant inside and around the top lip of the opened vessels.
- Carefully remove the used filter bags or cartridges using rubber gloves that have been disinfected with a 200 mg/L chlorine solution, per ANSI/AWWA Standard C653-03
- Install new filter bags or cartridges, and apply a light spray of disinfectant inside the exposed area of the vessel.
- Inspect the O-ring on the lid, and replace it if it is damaged. Coat with ANSI/AWWA approved lubricant.
- Close the filter vessel hatch and tighten the screw clamps.
- Record filter bag or cartridge change-out in the NO-DES unit log book.
- Open both inlet and outlet valves—slowly—to vent air and re-pressurize the vessels.
- Check for leaks.
- Open the bottom sand drains to remove any debris (if needed).
- Properly dispose of the used filter cartridges and bags.
- New unused filter bags and cartridges must be kept safely in their original containers and stored in a protected, clean environment.

- WARNING -

Do not change out NO-DES unit filter bags or cartridges in the rain or under conditions that could lead to contamination, such as heavy winds or dusty environments.

Section 9 – NO-DES Flow/Velocity Chart

NO-DES FLOW / VELOCITY CHART

For 3ft/sec Velocity

2"	29 gpm
4"	117 gpm
6"	264 gpm
8"	470 gpm
10"	734 gpm
12"	1057 gpm
14"	1439 gpm
16"	1880 gpm

For 5ft/sec Velocity

2"	49 gpm
4"	196 gpm
6"	441 gpm
8"	783 gpm
10"	1224 gpm
12"	1762 gpm
14"	2399 gpm

Section 10 - Reporting Errors and Recommending Improvements

You can help improve this manual. If you have a suggestion as to how these procedures could be improved, we would appreciate hearing from you.

Correspondence can be mailed to:

NO-DES, Inc.
ATTN: Chris Wilkinson
60 Hermanos Loop
Los Lunas, NM 87031

Or send an e-mail to wilkinson@no-des.com

Phone: 559-799-8415
Fax: 505-869-0520

NO-DES will reply to all queries.

EXHIBIT B

TERMS OF COMPLIANCE WITH CALIFORNIA LABOR LAW REQUIREMENTS

1. Consultant acknowledges that the project as defined in this Agreement between Contractor and the City, to which this Terms for Compliance with California Labor Law Requirements is attached and incorporated by reference, is a "public work" as defined in Division 2, Part 7, Chapter 1 (commencing with Section 1720) of the California Labor Code ("Chapter 1"). Further, Consultant acknowledges that this Agreement is subject to (a) Chapter 1, including without limitation Labor Code Section 1771 and (b) the rules and regulations established by the Director of Industrial Relations ("DIR") implementing such statutes. Consultant shall perform all work on the project as a public work. Consultant shall comply with and be bound by all the terms, rules and regulations described in 1(a) and 1(b) as though set forth in full herein.
2. California law requires the inclusion of specific Labor Code provisions in certain contracts. The inclusion of such specific provisions below, whether or not required by California law, does not alter the meaning or scope of Section 1 above.
3. Pursuant to Labor Code Section 1773.2, copies of the prevailing rate of per diem wages for each craft, classification, or type of worker needed to perform the Agreement are on file at City Hall and will be made available to any interested party on request. Consultant acknowledges receipt of a copy of the DIR determination of such prevailing rate of per diem wages, and Consultant shall post such rates at each job site covered by this Agreement.
4. Consultant shall comply with and be bound by the provisions of Labor Code Sections 1774 and 1775 concerning the payment of prevailing rates of wages to workers and the penalties for failure to pay prevailing wages. The Consultant shall, as a penalty to the City, forfeit two hundred dollars (\$200) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the DIR for the work or craft in which the worker is employed for any public work done pursuant to this Agreement by Consultant or by any subcontractor.
5. Consultant shall comply with and be bound by the provisions of Labor Code Section 1776, which requires Consultant and each subcontractor to: keep accurate payroll records and verify such records in writing under penalty of perjury, as specified in Section 1776; certify and make such payroll records available for inspection as provided by Section 1776; and inform the City of the location of the records.
6. Consultant shall comply with and be bound by the provisions of Labor Code Sections 1777.5, 1777.6 and 1777.7 and California Administrative Code title 8, section 200 *et seq.* concerning the employment of apprentices on public works projects. Consultant shall be responsible for compliance with these aforementioned Sections for all apprenticeable occupations. Prior to commencing work under this Agreement, Consultant shall provide City with a copy of the information submitted to any applicable apprenticeship program. Within sixty (60) days after concluding work pursuant to this

Agreement, Consultant and each of its subcontractors shall submit to the City a verified statement of the journeyman and apprentice hours performed under this Agreement.

7. Consultant acknowledges that eight (8) hours labor constitutes a legal day's work. Consultant shall comply with and be bound by Labor Code Section 1810. Consultant shall comply with and be bound by the provisions of Labor Code Section 1813 concerning penalties for workers who work excess hours. The Consultant shall, as a penalty to the City, forfeit twenty-five dollars (\$25) for each worker employed in the performance of this Agreement by the Consultant or by any subcontractor for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any one (1) calendar day and forty (40) hours in any one calendar week in violation of the provisions of Division 2, Part 7, Chapter 1, Article 3 of the Labor Code. Pursuant to Labor Code section 1815, work performed by employees of Consultant in excess of 8 hours per day, and 40 hours during any one week shall be permitted upon public work upon compensation for all hours worked in excess of 8 hours per day at not less than 1 1/2 times the basic rate of pay.

8. California Labor Code Sections 1860 and 3700 provide that every employer will be required to secure the payment of compensation to its employees. In accordance with the provisions of California Labor Code Section 1861, Consultant hereby certifies as follows:

"I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract."

9. For every subcontractor who will perform work on the project, Consultant shall be responsible for such subcontractor's compliance with Chapter 1 and Labor Code Sections 1860 and 3700, and Consultant shall include in the written contract between it and each subcontractor a copy of those statutory provisions and a requirement that each subcontractor shall comply with those statutory provisions. Consultant shall be required to take all actions necessary to enforce such contractual provisions and ensure subcontractor's compliance, including without limitation, conducting a periodic review of the certified payroll records of the subcontractor and upon becoming aware of the failure of the subcontractor to pay his or her workers the specified prevailing rate of wages. Consultant shall diligently take corrective action to halt or rectify any failure.

10. To the maximum extent permitted by law, Consultant shall indemnify, hold harmless and defend (at Consultant's expense with counsel reasonably acceptable to the City) the City, its officials, officers, employees, agents and independent contractors serving in the role of City officials, and volunteers from and against any demand or claim for damages, compensation, fines, penalties or other amounts arising out of or incidental to any acts or omissions listed above by any person or entity (including Consultant, its subcontractors, and each of their officials, officers, employees and agents) in connection with any work undertaken or in connection with the Agreement, including without limitation the payment of all consequential damages, attorneys' fees,

and other related costs and expenses. All duties of Consultant under this Section shall survive termination of the Agreement.