1.0 INTRODUCTION

This report is a summary of field inspection results during construction of the Muscoy Operable Unit (OU) Plant Transmission Pipeline, Phase I construction.

The construction inspection was performed by URSG Group, Inc. (URSG) for the United States Environmental Protection Agency (EPA). URSG performed the inspection under contract number 68-W-98-225 and work assignment member 016-RARA-09J5.

1.1 BACKGROUND

During a groundwater investigation in 1980, the California Department of Health Services (DHS) discovered chlorinated solvents in municipal supply wells within the northern San Bernardino/Muscoy region of San Bernardino. Several investigations were conducted to locate the potential source(s) of contamination. On March 30, 1989, EPA placed this region on the National Priorities List, thereby releasing federal funds for cleanup of the region, now identified as the Newmark Groundwater Contamination Superfund Site (site).

The principal contaminants identified in site investigations were trichloroethene (TCE) and tetrachloroethene (PCE). Reported concentrations of these contaminants exceed federal and California maximum contaminant levels (MCLs) for drinking water in several municipal wells within the San Bernardino and Muscoy areas, including the Newmark Municipal Wellfield.

A remedial investigation and a feasibility study were performed for the site between 1989 and 1994. Currently, the site is in remedial design and remedial action (RD/RA) phases. As part of the Newmark OU RD/RA, groundwater treatment systems and extraction wellhead facilities were installed and are currently operating. Design details of these facilities are presented in separate design documents. The Muscoy OU is currently in the RA phase, and this document is part of the RA effort for the Muscoy OU.

1.2 PROJECT DESCRIPTION

The Muscoy Plume OU RA includes construction of a pipeline that will connect five new groundwater extraction wells and one existing Newmark groundwater extraction well to an existing City of San Bernardino Municipal Water Department (SBMWD) water treatment plant located on W. 19th Street (19th Street Plant). After treatment at the 19th Street Plant, the treated water will be conveyed through existing SBMWD transmission pipelines.

Excess treated water will be provided to the San Bernardino Valley Municipal Water District (SBVMWD) through a new connection and pump station located near Encanto Park on W. 9th Street.

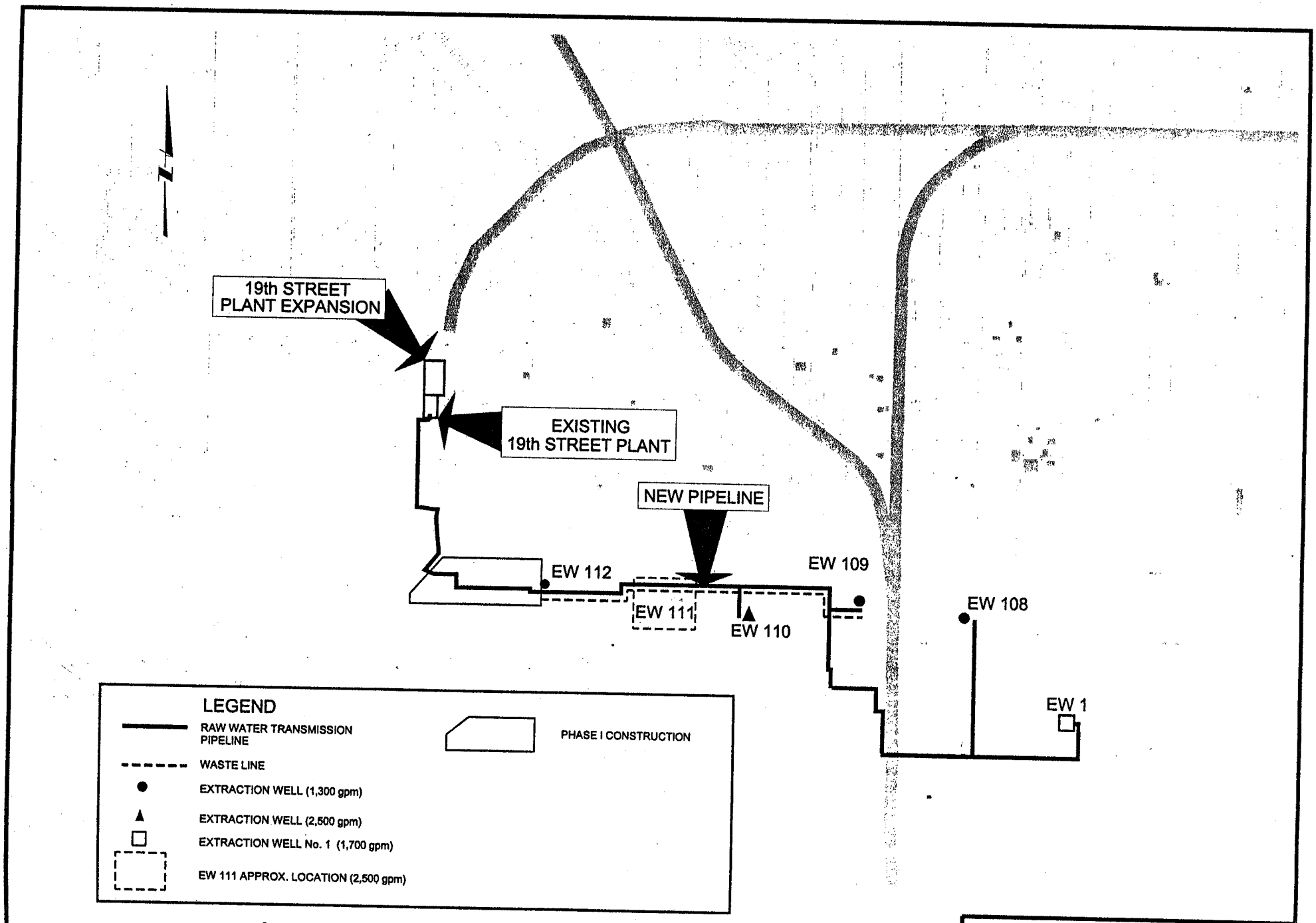
The pipeline system will serve several functions prior to the actual transmission of contaminated water for treatment at the 19th Street plant. Initially, various segments of the pipeline will be used to support the extraction well drilling effort by providing a means to dispose of untreated water generated during well pump testing.

Phase I construction included installation of a temporary waste pipeline for the 30-day pump test of Well 112. The pipeline was constructed of 30-inch diameter ductile iron pipe (DIP) from Station 40 + 11 (pipeline

stationing refers to 4,011 feet along pipeline) to Station 61 + 70. This section of the transmission pipeline was installed from Extraction Well 112 at W. Virginia Street to an existing municipal storm drain at N. Pennsylvania Avenue (Figure 1-1). This section of pipeline will be installed first as Phase I, followed by installation of the remainder of the pipeline route.

Doty Brothers Construction, Inc. (Doty) was procured and contracted by URSG to complete the Phase I construction.

Concurrently, the SBMWD was performing Phase I construction for two extraction wells which included site demolition and well drilling and construction. These activities are reported separately by the SBMWD.



URS
2520 VENTURE OAKS WAY, SUITE 250
SACRAMENTO, CA 95833-3200

Figure 1-1
Extraction Wells and Pipeline Route

2.0 CONSTRUCTION SUMMARY

2.1 TASKS COMPLETED

August 2000

- Bid documents were issued to ten potential bidders on August 10. These included Doty; El-Co Contractors, Inc.; Colich and Sons; Trautwein Construction, Inc.; Law Plumbing and Pipeline Co.; Merlin Johnson Construction, Inc.; Rivard, TA, Inc.; O-J-B Engineering, Inc.; U.S. Pipe and Foundry Co.; and Pacific States Cast Iron Pipe Co.;
- A pre-bid meeting was conducted on August 24 at the SBMWD office;
- The bid due date was August 31;
- The responding bidders included El-Co Contractors, Inc.; Colich and Sons; Trautwein Construction, Inc.; and Doty; and
- The successful bidder was Doty.

September 2000

- The contract was awarded on September 8; and
- After the Doty contractual submittals were reviewed, the Notice to Proceed was issued on September 21.

November 2000

- Doty mobilized equipment the week of November 24; and
- Doty commenced pot-holing the pipeline route

December 2000

- City arborist, Dennis Garrahan, evaluated a tree that was near the pipeline route. He recommended that the tree be removed. Although the tree may have lived, there was a concern about its stability. URSG attempted to utilize the services of a tree removal service; however, none were identified.
- Doty removed the tree at Medical Center Drive and Virginia Street.
- Pipe delivery was late and it arrived just prior to the Christmas holidays. At the request of URSG, Doty delayed construction until after the holiday season.

January 2001

- Doty commenced installation of pipe in Virginia Street on January 3;
- Compaction tests of the backfill were performed; and
- Temporary asphalt concrete (AC) was placed after backfill was compacted.

February 2001

- Continued with pipe installation, backfill, and temporary AC installation;
- Installed blow-off assembly at Virginia Street and Medical Center Drive;
- Installed air vacuum valve;
- Completed construction of the pipeline on February 5;
- Completed removing temporary AC and installed permanent AC;
- Commenced site clean-up;
- Applied for NPDES permit in order to perform the pipeline pressure test; and
- Performed a hydrostatic test of the pipeline on February 8.

2.2 PROBLEMS ENCOUNTERED AND RESPECTIVE SOLUTIONS

2.2.1 Problems Resulting in Deviations from Plans and Specifications

- An air vacuum was designed to be on the northeast corner of Medical Center Drive and W. Virginia Street. However, as a result of inadequate room at that location, it was installed at the southwest corner.
- Near the corner of W. Virginia Street and Flores Street, a gas main was broken. By the time it was repaired, it was late (approximately 7:30 PM) and the section was backfilled. However, an insufficient number of restraining joints were installed; therefore, a thrust block was installed at this corner.
- Two vertical offsets were designed to be installed through the utilities in Medical Center Drive. As a result of existing conditions, these offsets were not required, and pipe was laid straight through the utilities.
- The SBMWD required the use of the pipeline earlier in the well development phase than originally scheduled. The pipeline had passed the pressure test but had not been flushed or disinfected. Doty was instructed not to complete the flushing and disinfection. The SBMWD will take responsibility for these requirements.
- The pipe manufacturer did not supply the pipe on the schedule promised. The delay in construction did not affect the project schedule, and a time extension was granted to Doty.

2.2.2 Problems Resolved in Accordance with Plans and Specifications

- The well connection and waste line were originally installed with PVC pipe and concrete kickers. In compliance with the bid documents, the kickers were replaced with restrained pipe, and the main line connection was replaced with DIP.
- The location of the well connection pipe was changed by SBMWD; however, the construction accommodated this revision. The total length of pipeline was installed per the contract amount.
- Pipe material was delivered to the Well 112 site for temporary stockpiling instead of to the contractor's yard. This was contrary to agreements reached during the pre-construction meeting. Unrelated to, but concurrent with, the pipe stockpiling, neighbors expressed concerns about children playing on the vacant lot. The pipe was removed by Doty, and the SBMWD fenced their well site.
- Doty replaced a spandrel and cross gutter at Medical Center Drive and Virginia Street.

- On February 12, 2001, SBMWD notified Doty that an NPDES permit was required to perform the pressure test, flush, and chlorination of the pipeline. Doty applied for the permit immediately and received the permit the week of March 9, 2001.

2.2.3 Problems Resulting in Change Orders

- The location of the roots of a large tree at Medical Center Drive and Virginia Street created an obstacle for pipeline installation. A sewer line was nearby on the opposite side of the pipeline, and the pipeline could not be moved away from the tree. As a result, the tree was removed. Additionally, the tree had blocked the line of sight for cars crossing Medical Center Drive from W. Virginia Street. Therefore, local residents indicated appreciation of the tree removal.

2.3 QUALITY ASSURANCE TEST SUMMARY

2.3.1 Compaction Testing

Compaction tests were taken by Cal West, Inc. (CWI), a certified independent testing lab subcontracted by Doty. Compaction testing location and frequency were directed by the URSG construction inspector. Specific tests were taken beneath several replaced sewer laterals. Tests were taken of trench backfill, subgrade, and base material.

All compaction tests were taken with a nuclear density gauge, using the Nuclear Density Gauge method per ASTM standard D 2922. Trench backfill under the roadway was mechanically compacted to 90% of maximum density except for the top 6 inches, which was mechanically compacted to 95%. In any trench in which 95% density could not be achieved with existing backfill, the top 6 inches was to be replaced with backfill gravel mechanically compacted to 95%. Bedding and backfill beneath all sanitary sewer services were compacted to 95% of maximum density. Appendix A contains the compaction test result field summary sheets.

2.3.2 Hydrostatic Testing

The hydrostatic tests were performed according to the SBMWD Specification No. 1292, Section 6-1.1. All newly installed pipe was pressure tested at 225 pounds per inch continuously for a period of two hours. Water leakage was measured by determining the quantity of water required to maintain test pressure. Any water leakage was not to exceed 10 gallons per inch diameter per mile of pipe per 24 hours under these testing conditions. Pipe installation would not be acceptable until all leakages were stopped or until the leakage for the section of line tested was less than the rate of leakage specified. All pipelines passed the hydrostatic tests.

All newly installed pipe was disinfected. Chlorine was introduced into the pipeline filled with water by a water injector. The chlorine concentration was to be between 50 and 80 parts per million (ppm). This mixture was retained in the pipe for 24 hours. After this time, the chlorine residual was to be at least 25 ppm. Following chlorination, all water in the pipeline was flushed out until the replacement water showed the absence of chlorine. Following flushing, the pipe was allowed to set an additional 24 hours.

2.4 FIELD PERSONNEL

2.4.1 URSG

The URSG Construction Inspector was Frank DuBois, who was responsible for inspecting work performed by Doty. Mr. DuBois reported to Gary Smith, the URSG Construction Manager, and they were in communication by telephone or fax, depending on the appropriate media. Mr. Smith reported to Dwayne Deutscher, the URSG Site Manager. To resolve problems, agreements were reached between the appropriate parties, and EPA was consulted as required.

2.4.2 Agency

The following agencies were involved in the construction of the South Plant Transmission Pipeline, Phase I.

- SBMWD performed general oversight of the construction and located buried facilities exposed during excavation. The SBMWD Field Staff was Steve Ledbetter, who was responsible for overseeing the SBMWD field work. Mr. Ledbetter reported to James Dye, the SBMWD Supervisor.

- The San Bernardino Public Works Department was responsible for road inspection. The Construction Inspector for this department was Robert Nagy.

2.4.3 Subcontractor

The Doty Field Foreman was Ray Vasquez, who was responsible for directing work performed by Doty. Mr. Vasquez reported to Bill Richardson, the Doty General Superintendent. Mr. Richardson reported to David Lee, the Doty Project Manager.

2.5 COMMUNITY RELATIONS

URSG field personnel interfaced with the community in the field, answering routine questions. Concern was expressed by the community regarding children's access to the well site, where pipe was stockpiled. The pipe was removed, and the well site was fenced by SBMWD.

2.6 CHANGE ORDER SUMMARY

The following is a summary of the issued change orders:

1. To remove the tree at Medical Center Drive and Virginia Street.
2. To pay for NPDES permit costs.
3. To install geotextile underneath pavement.
4. To install additional pipe fittings.
5. Restocking charge for return of pipe fittings.

2.7 INSPECTOR'S DAILY REPORT SUMMARY

Appendix B contains summaries of the URSG inspector's daily reports.

2.8 CONSTRUCTION PHOTOS

Appendix C contains construction photos.

2.9 FINAL INSPECTION

A final punch list inspection was performed by the URSG Sacramento office engineering staff. No deficiencies were identified.

2.10 CONCLUSION

The scope of work associated with the Muscoy OU Plant Transmission Pipeline, Phase I construction, was completed according to the plans and specifications. The pipeline was ready for use pending tie-ins to the extraction wells by SBMWD. Record Drawings are included as Appendix D.