

Santa Ana Watershed Project Authority

**Inland Empire Brine Line
Operation and Maintenance Program Plan**

2019 Update

Final

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Inland Empire Brine Line Operation and Maintenance Program Plan

1.1 Background and Purpose

1.2 New Waste Discharge Requirements (WDRs) for Wastewater Collection System Owners

In May 2006, the SWRCB adopted Order No. 2006-0003, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems. All federal and state agencies, municipalities, counties, districts, and other public entities that own or operate sanitary sewer systems greater than one mile in length that collect and/or convey untreated or partially treated wastewater to a publicly owned treatment facility in the State of California are required to comply with the terms of this Order. The principal requirement of the WDRs is for each system owner to develop and implement a system-specific Sewer System Management Plan (SSMP). A prescribed element of the required SSMP is a description of the system owner's operation and maintenance (O&M) program.

Although the Santa Ana Watershed Project Authority (SAWPA) contracts with Western Municipal Water District (WMWD) for some of the O&M activities, and with the Inland Empire Utilities Agency (IEUA) for a portion of Reach IVA of the Brine Line, the WDR requirements are applied to the owner of the facilities. Therefore, SAWPA is the entity required to develop and implement a system-specific SSMP that includes the prescribed description of the O&M program for the Brine Line.

1.3 Purpose of This Document

SAWPA, WMWD, and IEUA each develop and maintain different types of system information, and perform various functions, related to the overall Brine Line O&M program.

The purpose of this document is to summarize the primary elements of the O&M program (s) currently in place for the Brine Line. The information is presented in a format that follows the prescribed program components included in the new SSMP requirements. This document is not intended to be an O&M Manual for the Brine Line.

1.4 SSMP O&M Program Requirement

According to the new requirements, the following O&M Program elements must be included in SAWPA's SSMP.

- † **Up-to-date System Mapping.** An up-to-date map of the sanitary sewer system, showing all gravity line segments and MASs, pressure pipes and valves, must be maintained.

- ↓ **Routine Preventive Maintenance Program.** Routine preventive operation and maintenance activities by staff and contractors must be provided, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The Preventative Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders.
- ↓ **Rehabilitation and Replacement Plan.** A rehabilitation and replacement plan must be developed that identifies and prioritizes system deficiencies and implements short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of MASs and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan.
- ↓ **Training.** Training should be provided on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained.
- ↓ **Equipment and Replacement Part Inventories.** Equipment and replacement part inventories should be available that include identification of critical replacement parts.

1.5 System Components and Limits of O&M Program Coverage

SAWPA is responsible for developing an SSMP and associated O&M Program for the components of the Brine Line that are owned by SAWPA. Figure 1 presents the Brine Line and identifies the Brine Line components that are owned by SAWPA. In addition to the pipelines that make up the various reaches of the Brine Line, SAWPA is also responsible for pipelines owned by SAWPA that connect various users from their meter to the Brine Line connection point. SAWPA refers to these connecting pipelines as laterals. Figure 1 also shows the “laterals” connecting various users to the Brine Line. The laterals range in length from 100 feet to nearly 22 miles (as in the case of Yucaipa Valley Water District). It should be noted that the term “lateral” typically refers to short runs of small diameter pipelines that connect residences and businesses to a sewer collection system. In the case of the Brine Line system, laterals typically refer to relatively long runs of pipelines that connect desalination facilities, industrial, commercial, or the flows from a portion of a community’s collection system to the Brine Line.

Laterals that are owned by other agencies, or are privately owned, are the responsibility of the owner.

1.6 Contract O&M

SAWPA contracts certain O&M activities. Figure 2 shows the areas of responsibility for contract O&M. WMWD provides some O&M support for the Brine Line, including emergency response. As shown on Figure 2, IEUA provides contract operations for the portion of Reach IV-A upstream of RP-2 (formerly known as S-05).

Eastern Municipal Water District maintains the Pressure Sustaining Station located on Reach V at Collier Street. The purpose of this valve is to assure that the EMWD pipeline feeding into the Brine Line system is maintained in a full condition at all times in order to keep the mortar lining hydrated.

2.1 Brine Line O&M Program Elements

The following summarizes the primary elements of the O&M program (s) currently in place for the Brine Line. The information is presented in a format that follows the prescribed program components included in the newly proposed SSMP requirements (as described above in Section 1.3).

2.2 System Mapping and Map Updating Process

SAWPA maintains a comprehensive set of system maps for both the Brine Line and its laterals. The maps cover the system components operated and maintained by SAWPA and WMWD and IEUA. These maps include all of the key system attributes prescribed by the SSMP requirements including gravity line segments, MASs, pressure pipes and valves (including air relief valves), and other key attributes. The maps are regularly maintained by SAWPA's GIS staff. Appendix A provides a set of Brine Line system aerial maps depicting the Brine Line segments and MASs. These drawings are available in SAWPA headquarters and are also carried in the Operations Staff maintenance vehicle, as well as WMWD Collection System staff supporting Brine Line O&M activities. By referencing the location on the system map, the O&M staff can readily obtain, from SAWPA GIS staff, the information summarized in Table 1.

| Table 1 | |
|---|--|
| Available Brine Line GIS Attribute Data (All in English Units) | |
| Maintenance Access Structures | <ul style="list-style-type: none"> Locations Invert elevation Top elevation Stationing, manhole identification number Sealed Status (Water Tight vs. Non Water Tight) |
| Air and Vacuum Release Valves (Reach IV-B and V) | <ul style="list-style-type: none"> Locations Stationing Above/Below Ground |
| Blow offs (Reach V) | <ul style="list-style-type: none"> Locations |
| Pipe Alignment | <ul style="list-style-type: none"> Location (manhole to manhole) Stationing Reach Pipe Material Pipe Diameter Slope Low flow rate, high flow rate (MGD) Low velocity, high velocity Year constructed Contract built under |
| Lateral Alignments | <ul style="list-style-type: none"> Discharger connection locations Location Permit Number Site ID Discharger Name Monthly flow volumes (MG) Water Quality Information - TSS, BOD sample results (mg/l) |
| CCTV'ed Areas | <ul style="list-style-type: none"> Pipe line inspected Locations of infiltration, cracks, sediment, photos (note that data files, photos, and videos are archived separately) |
| Record drawing sheets (and links to record drawings) | |

Note that IEUA is conducting a comprehensive assessment of the segment of Reach IV-A for which they are responsible. Although the attribute data for this segment is currently included in SAWPA's GIS system, IEUA is confirming the data and will also be incorporating the information in IEUA's GIS system.

2.3 Routine Preventative O&M Program

The Brine Line, and its associated laterals, is not a typical domestic wastewater collection system. The Brine Line is primarily a brine conveyance system that currently also accommodates permitted domestic wastewater dischargers. As illustrated on Figure 3, the Brine Line is made up of 72 miles of relatively large diameter pipelines ranging in size from 16 to 48 inches. As described earlier, dischargers connect to the Brine Line through pipeline “laterals” ranging in length from 100 feet to nearly 22 miles. (Operation and maintenance of 8,500 feet of the 13,000 foot CRC lateral is considered part of the WMWD system and is not part of SAWPA’s O&M program.)

Based upon the specific needs of the Brine Line and its laterals, SAWPA and its contract operators (WMWD and IEUA) have established and currently implement the following preventive O&M program activities. The current preventative O&M program includes both passive and active elements and can be separated into the following general categories:

- ↓ Self cleaning
- ↓ Manual Cleaning
- ↓ Physical System Protection
(Location Marking, Construction Coordination, Visual Inspection)

The overall purpose of the preventive O&M program is to conduct activities that reduce the potential for accumulation of materials within the system, or the potential for outside influences such as construction activities. This in turn will reduce the potential for subsequent system overflows or reduction of capacity. As described in the SSMP requirements, the current preventative O&M program targets cleaning and maintenance activities on known problem areas such as siphons and flumes in the Brine Line and its laterals.

2.3.1 Reliance on Cleaning Velocities for “Self Cleaning”

Over 90% of the Brine Line gravity segments have never been manually cleaned. The configuration of several reaches in the upstream Brine Line system include long distances between MAS. In many cases, the distances exceed 900 feet. In addition, several segments include special MAS that are sealed immediately above the flow and/or at the top of the MAS, and MAS that are seasonally submerged and require dewatering in order to enter the MAS. It is understood that these structures would qualify as “confined spaces”.

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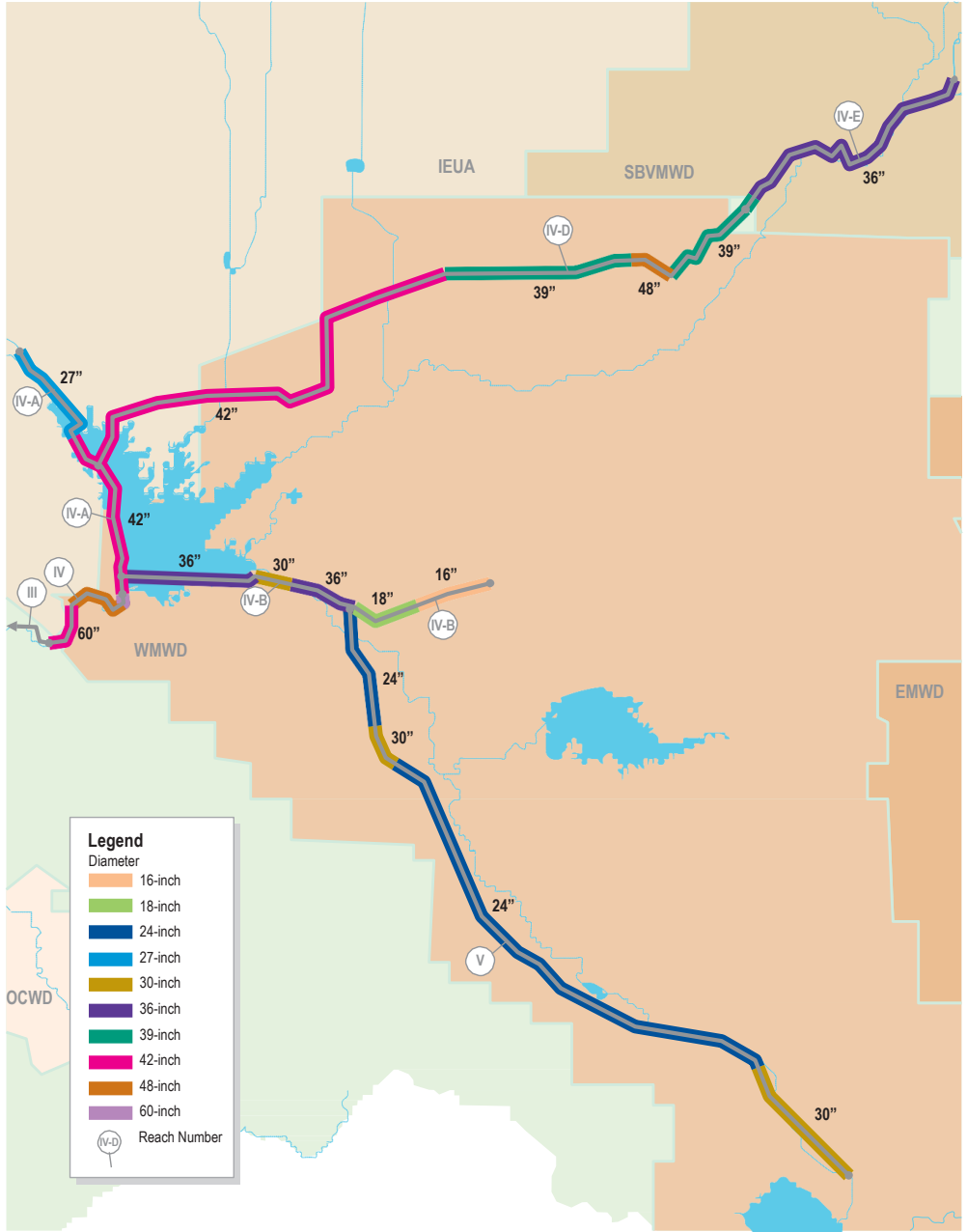


Figure 3
Pipe Diameters

Historically, it has been assumed that the velocity of the liquid stream in these pipelines are sufficient to provide “self cleaning.” Calculations conducted as part of the 2003 Brine Line Planning Study indicated that the current and projected flows in the Brine Lines appear to provide adequate cleaning velocities. However, the only way to confirm the effectiveness of this practice is through CCTV inspection. Prior and ongoing CCTV activities (discussed later in this section) are being used by SAWPA to confirm whether the historic self cleaning approach is reliable and acceptable. Recent CCTV inspection results have shown that in certain areas the self cleaning assumption was not valid. In localized areas, sediment build up has been identified. Depending upon the level of concern, these areas may be added to the cleaning program. SAWPA is currently evaluating the origin of the solids in order to determine if the build-up of sediment could be minimized or avoided through modified desalter operations or other system controls.

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The remaining 10% of the Brine Line gravity lines, or approximately 25,000 feet of Reaches IV, IV-A, IV-B, IV-D, and IV-E, are currently included in WMWD’s annual cleaning program, along with the laterals as described below. In addition, siphons and flumes located along the Brine Line are included in the regular cleaning schedule. Reach V is a pressurized system with no provisions for cleaning. SAWPA operates and maintains valves and other appurtenances associated with Reach V.

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2.3.2 Preventative O&M Program Elements

WMWD, by contract, operates and maintains the vast majority of the Brine Line for SAWPA. IEUA, by contract, operates and maintains meter station S-05 and the 27-inch diameter segment of Reach IVA upstream of meter S-05.

A copy of the 1995 Operations and Maintenance Agreement between SAWPA and WMWD is included in Appendix B. The contracted duties of WMWD are summarized in Table 2. A copy of the 1983 Operations and Maintenance Agreement between SAWPA and IEUA, and amendments 1 and 2 to the agreement is included in Appendix C. The contracted duties of IEUA are summarized in Table 3.

Commented [cq6]: Revise

2.3.2.1 WMWD Preventative O&M Program Responsibilities

For approximately 10% of the Brine Line gravity lines (approximately 25,000 feet), as well as 100% of the Brine Line laterals (approximately 20,000 Feet), WMWD conducts preventive operation and maintenance activities and provides a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. For the 10% of the Brine Lines that are actively cleaned, SAWPA’s Preventative Maintenance program includes a system that documents scheduled and conducted activities, such as work orders.

| Table 2 WMWD Contract O&M Duties |
|---|
| <ul style="list-style-type: none">▫ General Pipeline Operations▫ Emergency Response▫ Support for special projects, as required▫ Water Quality Sampling Support |

| Table 3 IEUA Contract O&M Duties |
|---|
| <ul style="list-style-type: none">▫ Support for special projects▫ Annual inspections▫ Line cleaning, as needed. |

The following provides a description of the major elements of the current Preventative Maintenance Program for the Brine Line segments and associated laterals.

2.3.2.1.1 Staffing

Currently, two WMWD staff are dedicated to the Brine Line (including laterals) for the primary purpose of visual inspection, response to Underground Service Alert (USA) alerts and coordination with construction activities, and to serve approximately 10% of the meter reading activities.

Cleaning operations are primarily conducted by WMWD crews who also service WMWD owned collection facilities. Cleaning crews typically consist of a senior Vactor truck operator and an assistant. WMWD collection system staff also conduct the majority of the meter reading activities (approximately 90%) that is not conducted by the two dedicated Brine Line O&M staff.

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2.3.2.1.2 Location and Marking/Inspection and Control/Monitoring Contractor Activities

Potential impacts associated with outside construction activities in the vicinity of the Brine Line or its laterals pose one of the highest risks to the system.

Therefore, a large portion of the preventive O&M program time is spent coordinating with construction projects in the vicinity of the Brine Line. SAWPA Operations staff spend a significant amount of time on visual inspections (for both construction activities as well as natural impacts (erosion and scour, etc.)), locating and marking the Brine Line, and coordination with contractors working in the vicinity of the Brine Line.

There are no specific Standard Operating Procedures in place for these activities. In general, the Operations Superintendent sets the schedule for himself and the Operations Pipeline Operators based upon seasonal considerations as well as the receipt of specific requests to consider the impacts of various construction projects that may be underway in the service area. In general the activities include the following:

- ↓ Driving the line. Portions of the off-road segments of the Brine Line are driven each day. The objective is to drive the entire off-road segments of the Brine Line each week. Observations are made for the following:
 - Subsidence
 - Scour during wet weather events
 - Identification of undocumented construction activities in the vicinity of the Brine Line
 - Spills

Should a spill be identified, a spill identification form must be completed and a spill response be initiated. A copy of the spill identification form is included in Appendix D. SAWPA's Emergency Response Plan is described later in this document.

- ↓ Line Marking, Coordination, and Site Viewing of Contractor Operations. This work includes:
 - Communication and coordination with Underground Service Alert (USA)
 - Line marking
 - Participation in construction meetings
 - "Meet and Mark" for smaller projects
 - More comprehensive meetings for larger projects

Currently, per the requirements of standard specifications included in typical public works contract documents, a contractor is required to notify USA in order to have the utilities in the vicinity of their construction project marked in the field. USA will then send a notification to SAWPA to mark the line. SAWPA then follows-up with the USA request and coordinates with the contractor and identifies the apparent level of risk associated with the proposed construction project. These activities typically take at least 3 to 4 hours each day and are difficult to schedule based upon the reactive nature of the current approach. However, the ability to identify potential problems and mitigate them before they become line breaks is essential to the success of the preventative maintenance program and avoidance of SSOs.

This process could be improved by earlier communication of proposed construction activities within the vicinity of the Brine Line by project proponents. SAWPA is currently considering methods to educate potential project proponents of the importance of the Brine Line, and to remind them of its existence and location. Due to the number of utilities in the vicinity of the Reach V segment of the Brine Line, and the fact that Reach V is a low pressure line, the potential for line breaks with more substantial spills is higher than other segments. Where practical, SAWPA has placed fiberglass markers indicating the location of the Brine Line to make contractors aware of the presence of the Brine Line.

2.3.2.1.3 Valve Operation and Other “Special Projects”

In addition to the line inspection and contractor coordination activities described above, SAWPA is responsible for a variety of other assignments associated with the preventative O&M program. These include:

- ↓ Reach V Valve Exercising Program. There are several air release and vacuum breaker (ARV) valves along Reach V. SAWPA exercises each of these valves at least once per year. Currently, the Brine Line Operations Superintendent schedules valve exercising during a 1 or 2 month period once per year.
- ↓ Gate Valve Operation. Though it is not a typical activity, the Brine Line Operations Superintendent is also responsible for making certain that gate valves located along Reach V are operated properly in order to avoid line damage and/or spills. In order to protect the system, a specific valve closing procedure has been established and is included as Appendix E.
- ↓ Right-of-Way Maintenance Management. Maintenance of Rights-Of-Way is a critical component of the preventative O&M program. Currently SAWPA performs the majority of this work and the level of effort depends upon seasonal growth of vegetation.
- ↓ CCTV Program Support. SAWPA provides oversight and support to CCTV contractors assisting in line inspection. The frequency of inspection depends on the section of the Brine Line. Some sections are inspected annually, others, due to access are inspected less frequently. Line frequencies are adjusted according to the CCTV inspection results.

- ↓ Meter Reading. Flow meters are read once per month. The effort related to this activity is approximately 1 day. The Brine Line Operations Superintendent assigns this work as needed. SAWPA uses a specialty contractor for flow meter maintenance and calibration.

2.3.2.1.4 Meter Reading

Flow meters are located throughout the Brine Line system in order to monitor flows from each SAWPA member agency as well as each permitted discharger. Figure 4 presents the location each of the meters. The fact that metering stations are located throughout the system is a very positive feature. According to O&M staff, historic meter readings indicate that the system does not appear to have problems with infiltration and inflow. O&M staff also noted that meter readings have never indicated any outflow.

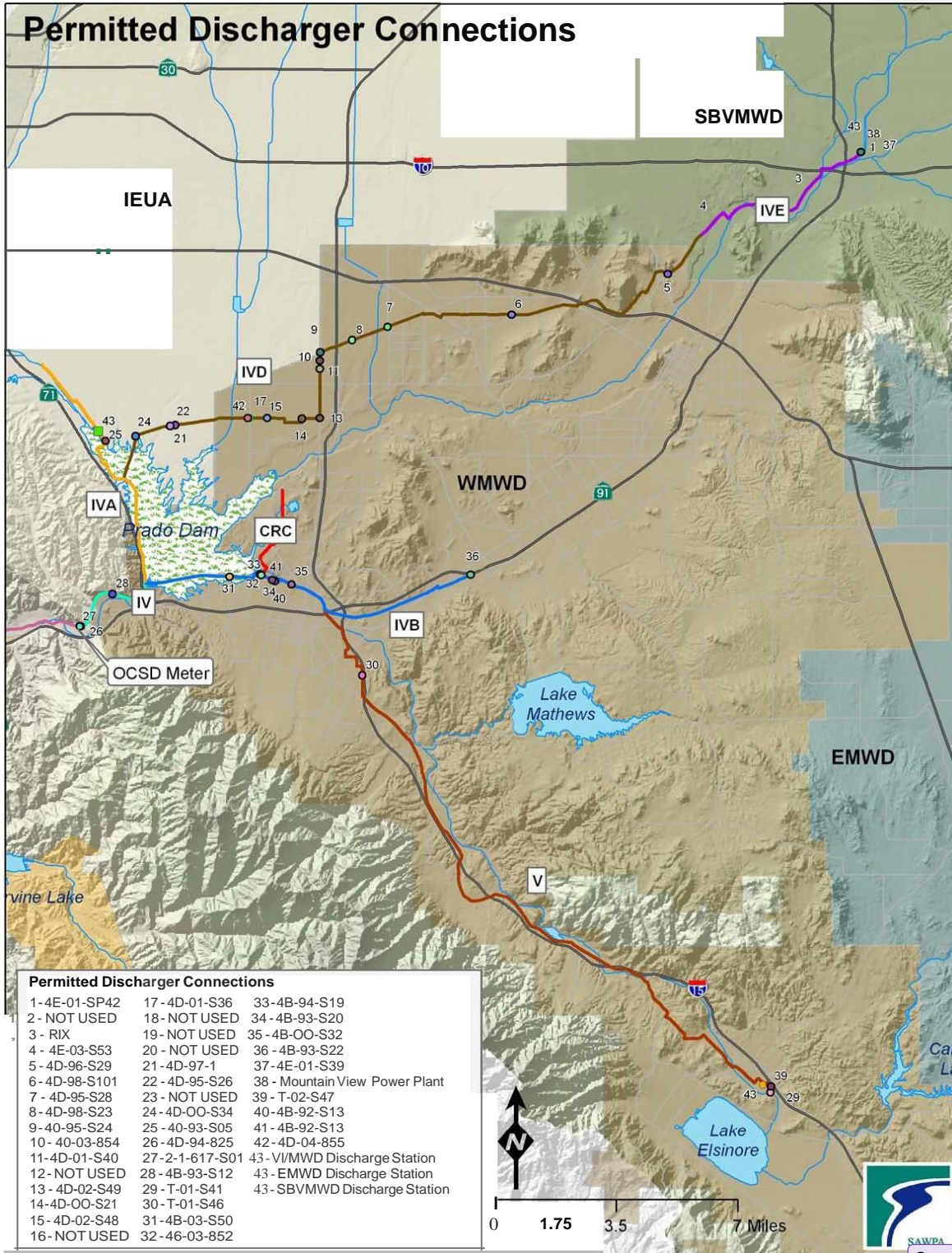
Meter readings are currently taken manually. Meter readings are logged on a simple 30 day chart. The meter locations are broken down into two routes (Routes 1 and 2). Readings are taken at the end of the month, provided is a business day, if not, meters are read the following working day. A typical meter reading form is included in Appendix G. A meter reading guidance sheet is also provided in order to make certain that the readings are taken properly. A copy of the meter reading guidance sheet is included as Appendix H.

SAWPA owns the meters. The meters on the Brine Line are regularly compared with the Orange County Sanitation District (OCSD) meter located at SARI Metering Station (S-01). The OCSD meter is calibrated annually, by OCSD.

Typically, there is less than 5% differential between the meter readings. Meter calibration is conducted by a specialty contractor. As described previously, oversight of meter calibration activities is provided by the SAWPA.

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Permitted Discharger Connections



Permitted Discharger Connections

| | | |
|----------------|------------------|--------------------------------|
| 1-4E-01-SP42 | 17-4D-01-S36 | 33-4B-94-S19 |
| 2 - NOT USED | 18 - NOT USED | 34 - 4B-93-S20 |
| 3 - RIX | 19 - NOT USED | 35 - 4B-00-S32 |
| 4 - 4E-03-S53 | 20 - NOT USED | 36 - 4B-93-S22 |
| 5 - 4D-96-S29 | 21 - 4D-97-1 | 37 - 4E-01-S39 |
| 6 - 4D-98-S101 | 22 - 4D-95-S26 | 38 - Mountain View Power Plant |
| 7 - 4D-95-S28 | 23 - NOT USED | 39 - T-02-S47 |
| 8 - 4D-98-S23 | 24 - 4D-00-S34 | 40 - 4B-92-S13 |
| 9 - 40-95-S24 | 25 - 40-93-S05 | 41 - 4B-92-S13 |
| 10 - 40-03-S54 | 26 - 4D-94-825 | 42 - 4D-04-855 |
| 11 - 4D-01-S40 | 27 - 2-1-617-S01 | 43 - VI/MWD Discharge Station |
| 12 - NOT USED | 28 - 4B-93-S12 | 43 - EMWD Discharge Station |
| 13 - 4D-02-S49 | 29 - T-01-S41 | 43 - SBVMWD Discharge Station |
| 14 - 4D-00-S21 | 30 - T-01-S46 | |
| 15 - 4D-02-S48 | 31 - 4B-03-S50 | |
| 16 - NOT USED | 32 - 46-03-852 | |



0 1.75 3.5 7 Miles



2.3.2.1.5 Manual Cleaning

As described previously, approximately 10% of the Brine Line system (approximately 25,000 feet) is manually cleaned. In addition, approximately 20,000 feet of Brine Line laterals are manually cleaned. There are approximately 16 siphons and flumes on the Brine Line that receive more regularly scheduled cleaning.

SAWPA staff does not have the ability to clean pipelines, so this activity is outsourced to specialty contractors.

SAWPA schedules any line cleaning activities based on the line cleaning schedule (Section D-3 of the Sewer System Management Plan). Work Orders are created using the GIS-based management system developed by SAWPA staff.

Table 4 presents the current Brine Line Reach Cleaning Yearly Schedule. Table 5 presents the Brine Line Lateral Sewer Cleaning Yearly Schedule. Table 6 presents siphon and flume cleaning schedule.

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The current program first focuses on the Brine Line siphons and flumes, then on the laterals, and then on the Brine Line reaches.

Note that other than the intermittent ARV exercising activities, currently there is no maintenance conducted on Reach V. Reach V is a low pressure pipeline that does not have pigging stations or other means to facilitate manual cleaning. However, several maintenance access structures were recently installed as part of the Reach 5 Rehabilitation project in case access to the pipe is needed for maintenance or as a way to isolate certain portions of Reach 5 and perform repairs.

2.3.2.1.6 Reportable Incident Notification and Emergency Response

As shown in Appendix J, there is also a Reportable Incident Notification Log that must be submitted in the event of a sewer spill. SAWPA also has an emergency response plan that provides a comprehensive description of the procedure to be following in the case of a spill. Due to the size of the document, the Emergency Response Plan has not been included as an appendix. The Emergency Response Plan should be referenced for specific spill response procedures.

**TABLE 4
WESTERN MUNICIPAL WATER DISTRICT
BRINE LINE REACH CLEANING YEARLY**

| REACH CLEANED | DISTANCE CLEANED (FEET) | CLEANING FREQUENCY | PROJECTED CLEANING | ACTUAL CLEANED | WORKERS NEEDED | HOURS PER WORKER | TOTAL HOURS | Thomas Guide Coordinates | |
|---|-------------------------|---|--------------------|----------------|-------------------------|------------------|-------------|--------------------------|--|
| REACH 4 AND 4B | | | | | | | | | |
| Arlington Desalter to Pierce St | 1452 | once per year | | | 3 | 6 | 18 | 744 D2 | |
| Pierce St to Buchanan St | 2244 | once per year | | | 3 | 6 | 18 | 744 C3 | |
| Buchanan St to Mckinley | 4620 | once per five years | | | Line can only be pigged | | | 744 B3 | |
| Mckinley St to Corporate St | 4000 | once per year | | | 4 | 16 | 64 | 743 J4 | |
| Corporate St to Radio Rd | 2376 | once per year | | | 3 | 6 | 18 | 743 H5 | |
| Radio Rd to 91 Fwy | 2904 | once per year | | | 3 | 6 | 18 | 743 F5 | |
| 91 Fwy to Temescal siphon | 792 | once per year | | | 3 | 6 | 18 | 743 E4 | |
| Temescal siphon to Lincoln/SRPS | 6864 | once per year | | | 3 | 40 | 120 | 743 B3 | |
| SEWER CLEANING FEET AND WORKER HOURS | | | | | | | | | |
| TOTAL FEET SEWER CLEANED/YEAR | 25252 | TOTAL HOURS/WORKER/YEAR SEWER CLEANING | | | | 274 | | | |
| Note: Cleaning requiring 3 workers has special considerations such as traffic control or hazardous entry. | | | | | | | | | |

**TABLE 5
WESTERN MUNICIPAL WATER DISTRICT
BRINE LINE LATERAL SEWER CLEANING YEARLY SCHEDULE**

| LATERAL/REACH | SECTION CLEANED | DISTANCE CLEANED (FEET) | CLEANING FREQUENCY | PROJECTED CLEANING | ACTUAL CLEANING | WORKERS NEEDED | HOURS PER WORKER | TOTAL HOURS NEEDED | Thomas Guide Coordinates |
|---|---|-------------------------|--------------------|--------------------------------|-----------------|----------------|------------------|--------------------|--------------------------|
| Greenriver Corona 4 | Cleaning done when flume is cleaned | | once per year | | | NA | NA | | 742 B4 |
| IEUA 4A | Reach 4A IEUA meter to Chino Siphon | 800 | once per year | | | 2 | 5 | 10 | 712 A2 |
| Temescal Desalter 4B | Temescal Desalter to Temescal Wash | 3000 | every 2 years | Line can only be pigged. | | | | 0 | 713 C4 |
| CRC 4B | 5th & Western to Rincon | 12936 | once per year | | | 3 | 40 | 120 | 713 C5 |
| Corona Plant #1 4B** | Corona headworks to Butterfield connection | 2000 | once per year | | | 3 | 32 | 96 | 742 H3 |
| Cheese Plant 4B* | Cheese Plant meter to Brine Line connection | 125 | six times per year | | | 2 | 2 | 4 | 743 B3 |
| Jurupa Cleveland 4D | Cleveland meter to Brine Line connection | 150 | twice per year | | | 2 | 8 | 16 | 683 D7 |
| Jurupa Chandler 4D | Chandler meter to Brine Line connection | 400 | once per year | Line can only be pigged. | | | | 0 | 713 A3 |
| Jurupa 56th St 4D | 56th St meter to Brine Line connection | 400 | once per year | Line can only be pigged. | | | | 0 | |
| Jurupa Etiwanda 4D | Etiwanda meter to Brine Line connection | 250 | twice per year | | | 3 | 10 | 30 | 683 H2 |
| Jurupa Winneville 4D | Winneville meter to Brine Line connection | 100 | twice per year | | | 2 | 8 | 16 | 683 F3 |
| Jurupa Hamner 4D | Hamner meter to Brine Line Connection | 200 | twice per year | | | 2 | 8 | 16 | 683 E3 |
| CIW 4D | CIW meter to Brine Line connection | 300 | once per year | | | 3 | 4 | 12 | 712 E1 |
| Stringfellow 4D | Stringfellow meter to Brine Line connection | 150 | twice per year | | | 4 | 4 | 16 | 684 F1 |
| TOTAL FEET SEWER CLEANED PER YEAR | | 20811 | | TOTAL WORKER HOURS/YEAR | | | 336 | | |
| Note: Cleaning requiring 3 or more workers has special considerations such as traffic control or hazardous entry. * Cheese Plant must be shutdown while cleaning. ** MASS must be unsealed prior to cleaning. | | | | | | | | | |

**Table 6
Siphon and Flume Cleaning**

| | Jan | Feb | Mar | April | May | June | July | Aug | Sept | Oct | Nov | Dec | Thomas Guide |
|--|---------------|-----|-----|---------------|-----|------|---------------|-----|------|---------------|-----|-----|--------------|
| Brine Line - Green River Golf | | | | | | | | | | | | | 742-A6 |
| Brine Line - Green River/Corona Flume | not scheduled | | | not scheduled | | | not scheduled | | | not scheduled | | | 742-C4 |
| Brine Line - Calif. Rehab Center Flume | not scheduled | | | not scheduled | | | not scheduled | | | not scheduled | | | 713-C5 |
| Brine Line - Cleveland Flume | not scheduled | | | not scheduled | | | not scheduled | | | not scheduled | | | 683-D7 |
| Brine Line - Chandler Flume | not scheduled | | | not scheduled | | | not scheduled | | | not scheduled | | | 713-A3 |
| Brine Line - JCSD/Hamner/Flume | | | | | | | | | | | | | 683-E3 |
| Brine Line - JCSD/Wineville Flume | | | | | | | | | | | | | 683-F3 |
| Brine Line - Stringfellow Flume | not scheduled | | | not scheduled | | | not scheduled | | | not scheduled | | | 684-71 |
| Brine Line - JCSD/Etiwanda Flume | not scheduled | | | not scheduled | | | not scheduled | | | not scheduled | | | 683-H2 |
| Brine Line - Calif. Institute for Woman Flume | not scheduled | | | not scheduled | | | not scheduled | | | not scheduled | | | 712-E1 |
| Brine Line - Calif. Cheese Flume & Lateral | | | | | | | | | | | | | 743-B3 |
| Brine Line - Temescal Siphon | not scheduled | | | not scheduled | | | not scheduled | | | not scheduled | | | 743-E4 |
| Brine Line - Euclid Siphon | not scheduled | | | not scheduled | | | not scheduled | | | not scheduled | | | 712-C4 |
| Brine Line - Chino/Pine Street | not scheduled | | | not scheduled | | | not scheduled | | | not scheduled | | | 712-A2 |
| Brine Line - Schleisman Siphon* (at flood control | | | | | | | | | | | | | 712-J1 |
| Brine Line - Cantu Galleano | not scheduled | | | not scheduled | | | not scheduled | | | not scheduled | | | 684-B1 |
| Note: Blank spaces scheduled to be cleaned for that month * Cleaned twice per month | | | | | | | | | | | | | |

2.2.2.2 IEUA's Preventative O&M Program Responsibilities

2.2.2.2.1 Visual Inspection and USA Coordination

Reach IV-A O&M responsibilities have shifted to SAWPA. SAWPA relies on IEUA on an as needed basis to provide support, line cleaning, and inspections.

SAWPA staff responds to USA DigAlert requests to mark the Brine Line and coordinate with construction activities in order to avoid potential Brine Line breaks by contractors working in the vicinity of the pipeline.

2.2.2.2 Pipeline Cleaning and Documentation

There are currently five direct connections to this segment of Reach IV-A, including the collection station located at IEUA's Regional Plant No. 2. Since the flow in Reach IV-A has been much lower than the capacity, this 27-inch diameter pipeline was historically considered a low risk component of the system and was never manually cleaned. In addition, approximately half of the MASs have double lids since they are located in a flood zone. This situation makes regular access more of a challenge. However, during a recent condition assessment including CCTV inspection, it was determined that a significant amount of solids have been collecting in the pipeline. SAWPA has since initiated a complete cleaning and CCTV inspection of the entire length of Reach IV-A Upper.

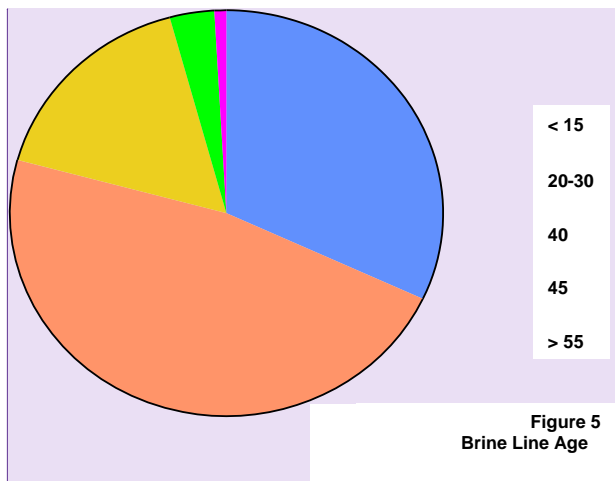
Based upon the results of the CCTV inspection, IEUA intends to identify potential problem areas along this segment of Reach IV-A for inclusion in IEUA's regular pipeline cleaning program. There are two siphons located along Reach IVA that will definitely be included in IEUA's regular siphon cleaning program. As part of this program, siphons are cleaned at least twice per year, and more frequently if necessary. As part of the ongoing CCTV inspection, all MASs and risers are also being inspected.

IEUA's scheduling and reporting process is currently a manual paper-based system similar to WMWD's. Work orders are initiated by headquarters and field crews report activities and service requirements to headquarters for logging and scheduling of needed maintenance. IEUA also intends to implement a CMMS in the future.

2.3 Rehabilitation and Replacement Plan

As prescribed by the new SSMP requirements, a rehabilitation and replacement plan must be developed that identifies and prioritizes system deficiencies and implements short-term and long-term rehabilitation actions to address each deficiency. The rehabilitation and replacement plan must include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan.

The majority of the existing Brine Line is in the early stages of its lifecycle. As shown on Figure 5, 96% of the Brine Line is less than 30 years old and 99% of the system is less than 35 years old. The 1% that is older than 35 years will be replaced as part of the Prado Dam expansion currently underway.



Commented [cq11]: Revise with 2019 as a reference.

Figure 6 provides a summary of the pipeline materials of the Brine Line. Most of the pipeline materials making up the Brine Line should provide an estimated life of 50 to 75 years assuming proper design and installation and normal use and maintenance. However, CCTV inspections identified over 34,000 feet of unlined RCP pipe along Reach IV-A and part of Reach IV-B that was shown on the original plans as lined RCP but on the as-built drawings as un-lined. The fact that these sections are unlined could significantly reduce the life expectancy of these segments depending upon the atmosphere in the pipe and other dynamics. This reinforces the importance of CCTV inspection. There are also short steel segments over 55 years old in the vicinity of the Prado Dam that will be replaced as part of the Prado Dam expansion project.

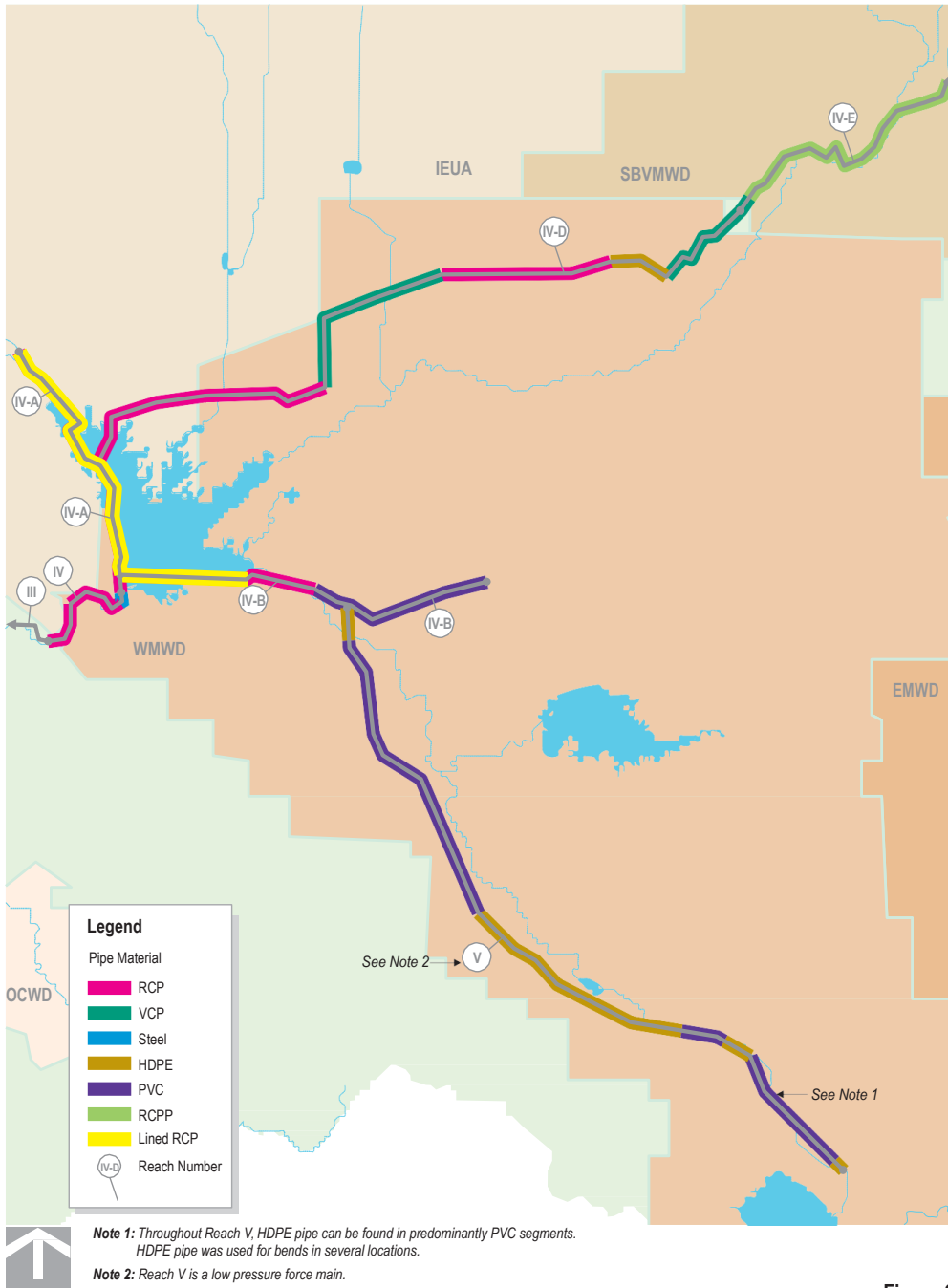


Figure 6
Material of Construction

SAWPA currently has a rehabilitation and maintenance plan in place for the Brine Line that reflects the age and component materials of the system. The following summarizes the key components of the Brine Line Rehabilitation and Replacement Plan as prescribed in the SSMP requirements.

2.3.1 Identification and Prioritization of System Deficiencies

The methods currently used for the identification and prioritization of Brine Line deficiencies include:

- ↓ Information obtained from routine preventative maintenance activities.
- ↓ CCTV inspection program.
- ↓ MAS inspection program.
- ↓ Hydraulic modeling to identify potential hydraulic problems.

2.3.1.1 Information from routine preventive maintenance activities

Routine preventative maintenance activities were described earlier in this document. Deficiencies identified during these activities are included in short term and longer term capital improvement programs. Critical repairs are conducted immediately upon approval of work orders described previously.

2.3.1.2 CCTV Inspection Program

The new SSMP requirements prescribe that the rehabilitation and replacement program should include regular visual and TV inspections of MASs and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation.

As a result of the 2002 Brine Line Planning Study, a Closed Circuit Television (CCTV) inspection program was established for the majority of the Brine Line. Figure 7 provides a graphic representation of the segments of the Brine Line where CCTV activities have been completed and segments where CCTV will be completed in 2007. A copy of the Brine Line Video Inspection "Technical Specification For Close Circuit Television Sewer Inspection" is included as Appendix K. A detailed schedule for the CCTV activities for each segment of the Brine Line to be CCTVed is included as part of the Technical Specification in Appendix K. This list provides a MAS to MAS summary of the program.

As described in the Appendix K, SAWPA requires the video inspections to comply with the latest industry (NASSCO) standards for collecting and assessing information. CCTV information is also linked to the system mapping described earlier in this document.

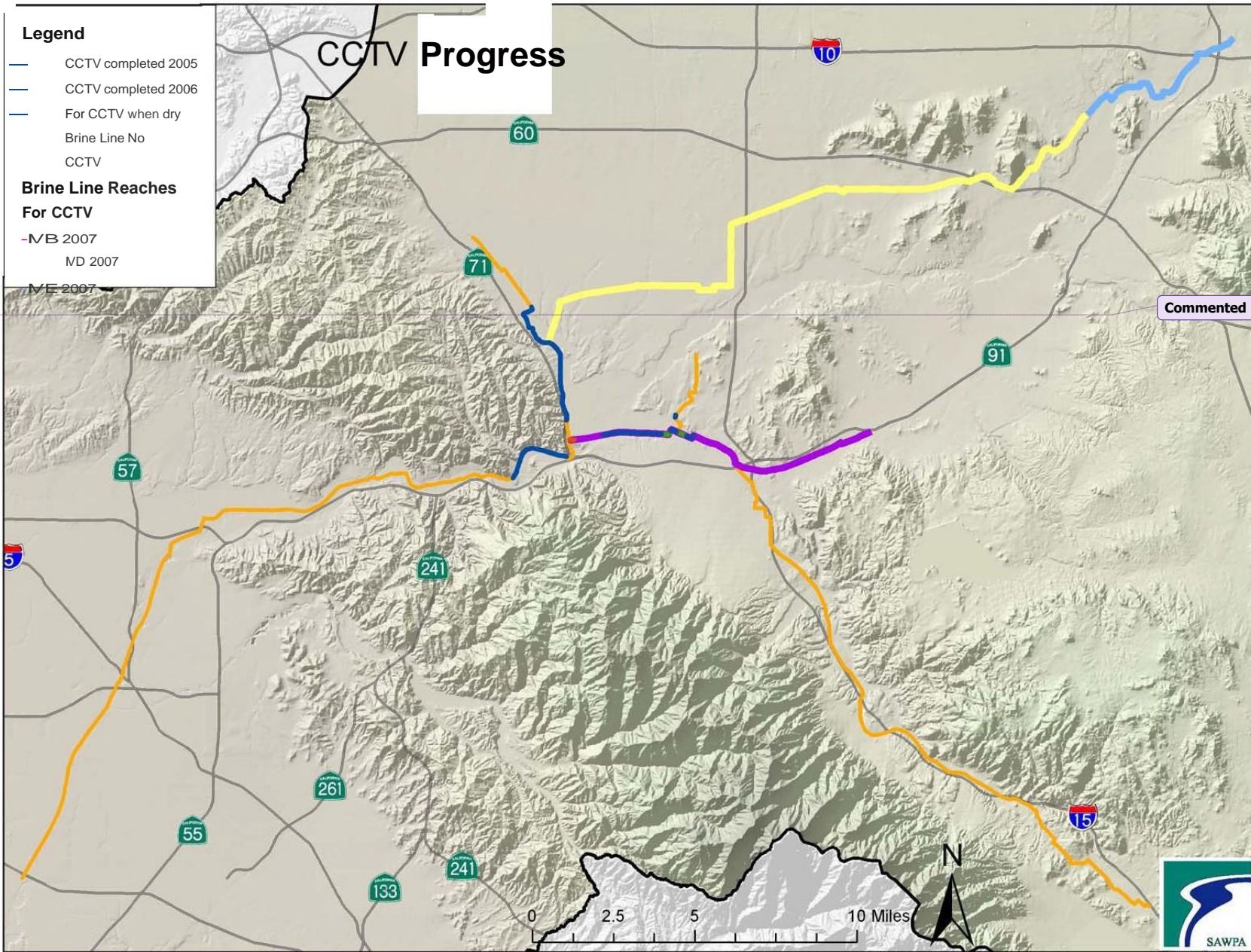
CCTV Progress

Legend

- CCTV completed 2005
- CCTV completed 2006
- For CCTV when dry
- Brine Line No
- CCTV

Brine Line Reaches For CCTV

- MB 2007
- ND 2007
- ME 2007



Commented [cq12]: Update

The findings of the CCTV inspection will be used to determine and prioritize deficiencies. The information from the CCTV inspections will be used to establish capital projects to be included in SAWPA's Capital Improvement Program (CIP) for the Brine Line. The CIP is described later in this document.

As described earlier, IEUA is currently conducting a complete CCTV program for the upper segment of Reach IV-A.

Since 90 % of the Brine Line is not manually cleaned, the newly establish CCTV program is a critical component of the overall O&M program. This work must be diligently conducted in order to confirm whether the "Self Cleaning" approach has worked previously and will continue to be viable in the future. Problem areas in which the self cleaning is not found to be effective are to be included in the regular manual cleaning schedule. The frequency of cleaning will need to reflect the severity of the problem area.

2.3.1.3 MAS Inspection Program

There are a variety of MAS types throughout the Brine Line. A limited number of MASs are inspected as part of the cleaning and CCTV operations. Many of the MASs have bolted and sealed covers since they are in remote areas that are subject to flooding. Currently, there is no formal MAS inspection program. Therefore, the majority of the MASs are not inspected on a routine basis. Typically, MAS inspections should occur at least once every one to five years. Inspections should be more frequent for MASs subject to vehicle traffic. Though the existing MASs are lined, it is possible that damage during manufacturing, installation, or normal operation and maintenance could impact their integrity.

In general, the objective of a general MAS inspection would determine the proper elevation or grades around the lid, be sure that the lid is not buried, and examine the structural integrity (presence of cracks) and functional capacity of the MAS. When completed, a MAS inspection program should include the following elements:

- ▶ Accessibility
- ▶ Proper drainage from the cover
- ▶ Cracks or breaks in the wall or bottom
- ▶ Infiltration
- ▶ Joint security
- ▶ Grease accumulation
- ▶ Debris accumulation
- ▶ Design or construction flaws in the invert that cause turbulence
- ▶ Grout bed or frame

- ↓ Corrosion
- ↓ Cracks in MAS ring
- ↓ Warped or misfit lid – no rattle or rock, bolted in place
- ↓ Ring clean and seated properly
- ↓ Signs of potential problems with the lining such a “bubbling”
- ↓ Properly marked

2.3.1.4 Hydraulic Modeling

SAWPA recently completed hydraulic modeling of the entire Brine Line.

Based upon this analysis, the projects were identified to mitigate potential hydraulic deficiencies in the system. These projects are included in SAWPA’s Capital Improvement Project.

2.3.2 Capital Improvement Plan and Implementation Schedule

The rehabilitation and replacement plan must also include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan.

Appendix L presents SAWPA’s Capital Improvement Plan (CIP). The SAWPA CIP includes the improvements required to mitigate pipeline integrity or capacity issues identified during the activities described previously.

2.4 Training Program

2.4.1 WMWD’s Training Program

WMWD provides the following formal training to each member of its O&M staff:

- | | | |
|---|--------------------------------------|----------|
| x | Confined space entry and rescue | Annually |
| x | Trench shoring | Annually |
| x | First aid and CPR | Annually |
| x | Spill Response | Annually |
| x | SAWPA Training (WDR Spill Reporting) | Annually |

With the exception of a training video for the use of the Vector Truck, WMWD currently relies on on-the-job training for basic system cleaning and surveillance

activities. Senior staff are paired with junior staff in order to effectively and safely carry out system O&M activities.

2.4.2 IEUA's Training Program

IEUA provides safety training similar to WMWD. In addition, as part of their SSO Unified Response Guideline Plan, IEUA conducts regular training regarding spill response.

2.5 Equipment and Replacement Part Inventories

Per the SSMP requirements, equipment and replacement part inventories should be available that include identification of critical replacement parts. Since there are no pump stations associated with the Brine Line, and the Brine Line pipelines are relatively large in diameter, the replacement part inventory is very limited.

2.5.1 Equipment and Replacement Part Inventory

Maintenance trucks are equipped for minor repairs on smaller diameter pipelines. SAWPA has a limited inventory of pipeline materials available to conduct repairs to the Brine Line. Typically, SAWPA relies on specialty contractors to conduct the repairs.

Materials currently stored include:

- ↓ Small sections of PVC and Polyethylene pipe.
- ↓ Repair clamps for 24 and 30 inch PVC pipe.
- ↓ MASs and riser rings

There are multiple materials suppliers in the area that carry the applicable pipeline components. Material suppliers include:

- ↓ Inland Water Works
- ↓ Western Water Works

Air relief valves (ARV) are all provided with isolation valves. Therefore, if an ARV is damaged, a new valve could be ordered and an inventory of valves is not needed.

SAWPA also has a list of contractors who can assist in the repair activities. A full list is available as Appendix D in the Overflow and Emergency Response Plan.

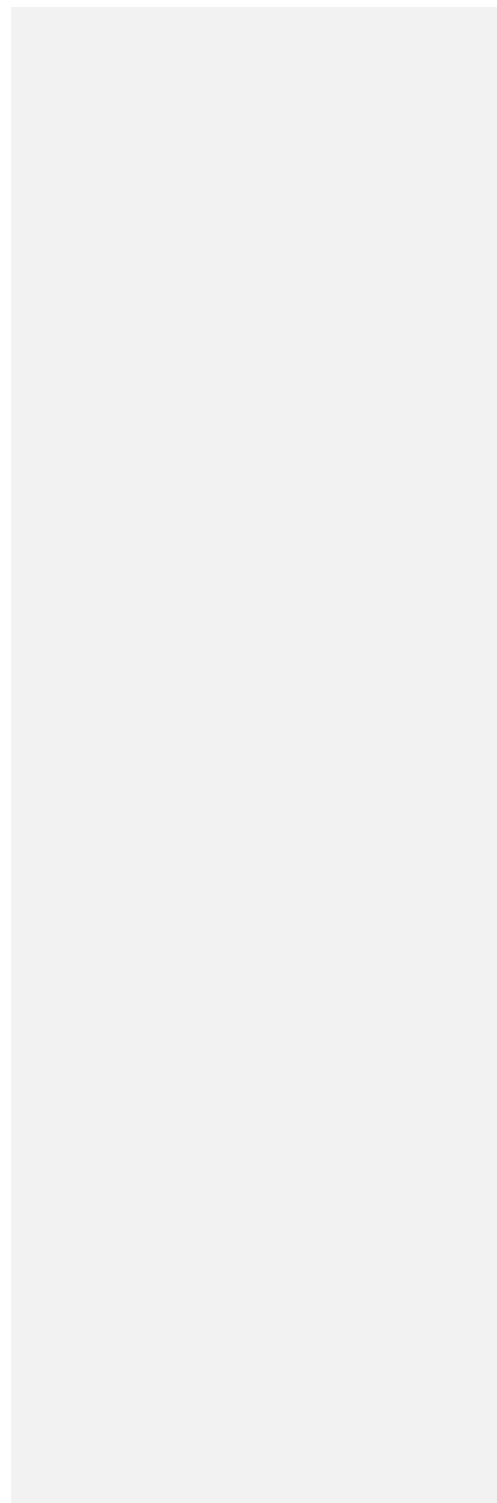
SAWPA follows its procurement policy for the advertisement and award of related contracts.

As described earlier, SAWPA has a comprehensive Emergency Response Plan in place that describes the procedures to be used to effectively respond to a spill or line break.

SAWPA is part of Mutual Aid groups (ERNIE and CalWARN) in order to obtain assistance in case of an emergency.

Appendix A

Orthophoto System

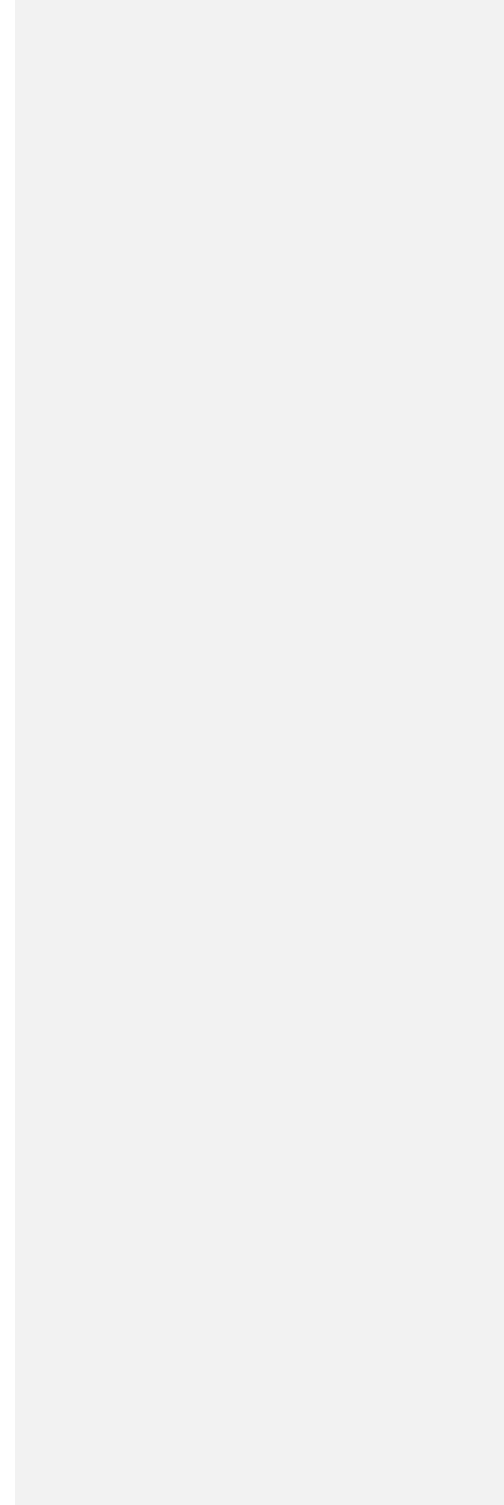


Appendix B

WMWD Operation and Maintenance Agreement

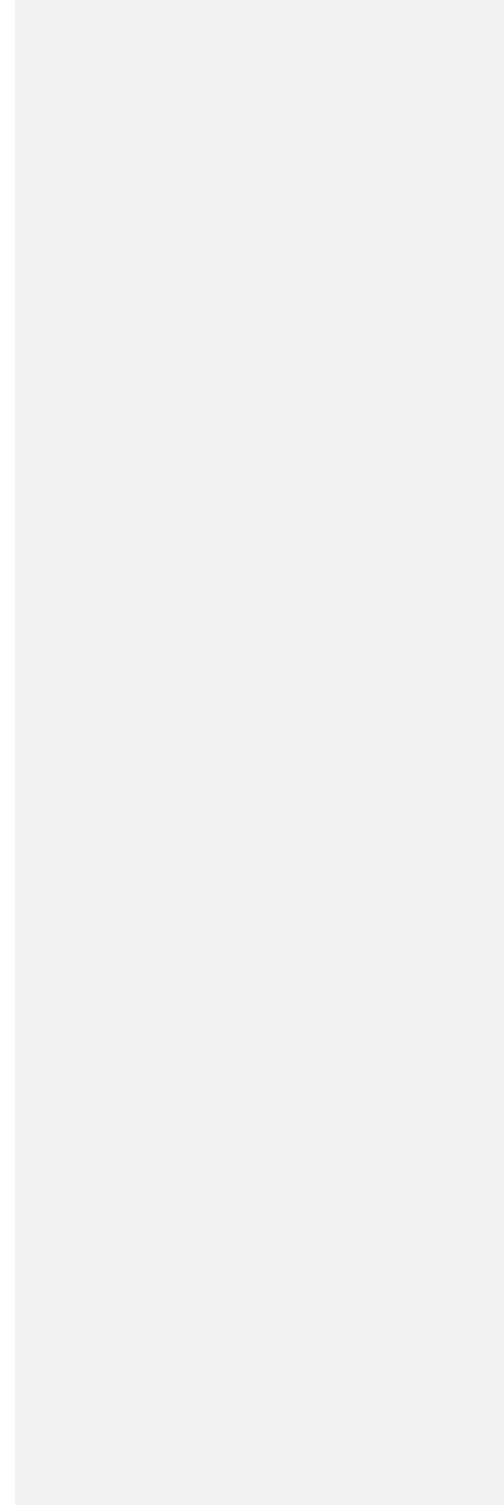
Appendix C

IEUA Operation and Maintenance Agreement



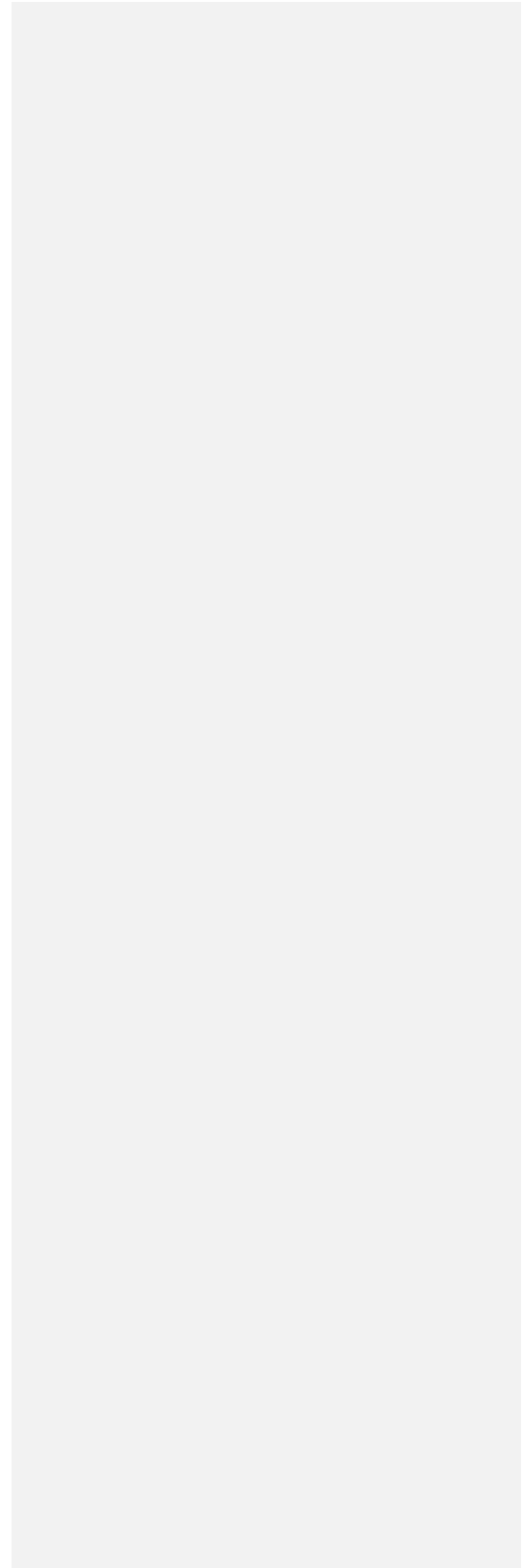
Appendix D

SAWPA Spill Response Plan



Appendix E

Proposed Brine Line Protection Signage



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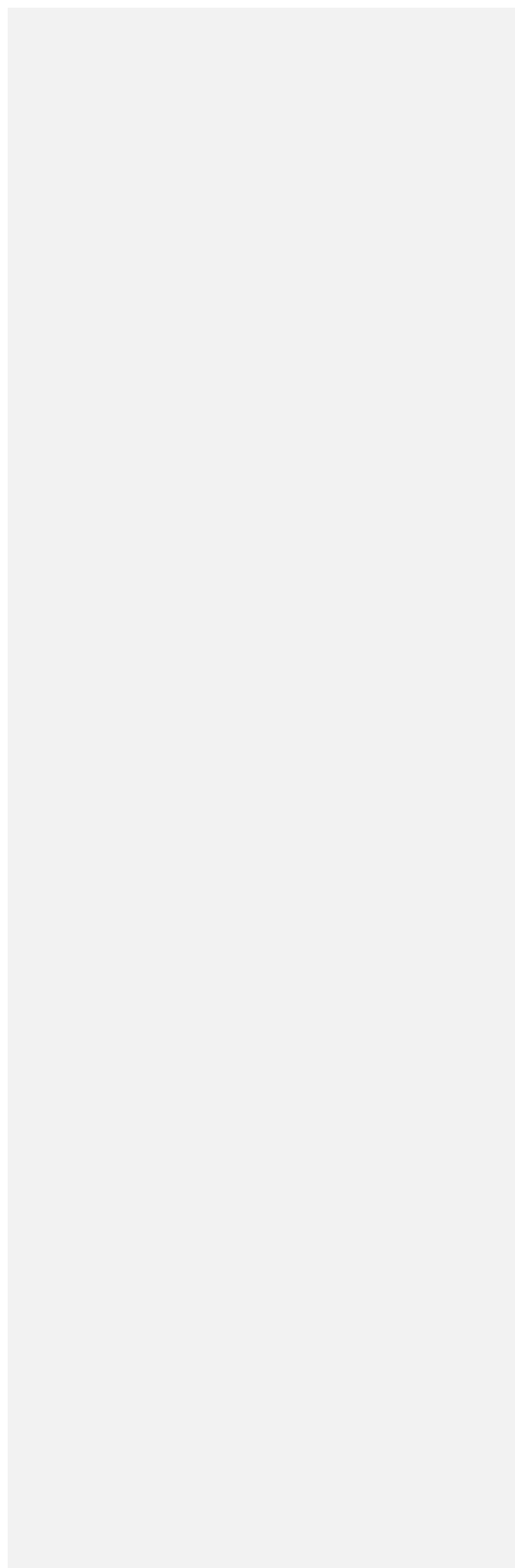
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Appendix F

Reach V Gate Valve Operating Procedures

Reach V Gate Valve Operating Procedures

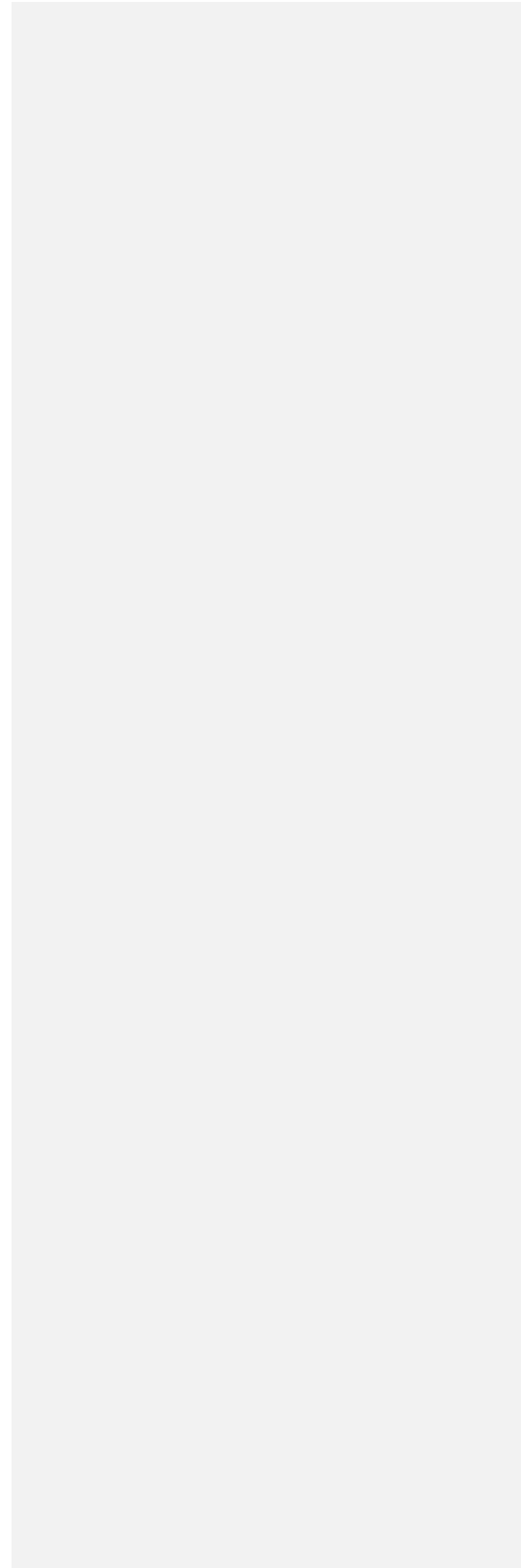
- 1) All valve operating sequences start from downstream to upstream (for closing and opening)
- 2) Assure that all air-vac valves are open and operating properly
- 3) Assure that all gate valves are operating properly and will close & seal
- 4) Never close a gate valve without knowing the flow rate in the pipe for the past hour and a-half; and for the foreseeable future; and have an operating flow meter
- 5) Never operate a gate valve without a designated & acknowledged responsible SAWPA Employee
- 6) Always have a operation plan authorized by the responsible SAWPA Employee
- 7) Have a signed acknowledgement line on the plan for all operators and dischargers
- 8) Never exceed the internal design pressure

Appendix G

Typical SAWPA Meter Reading Form

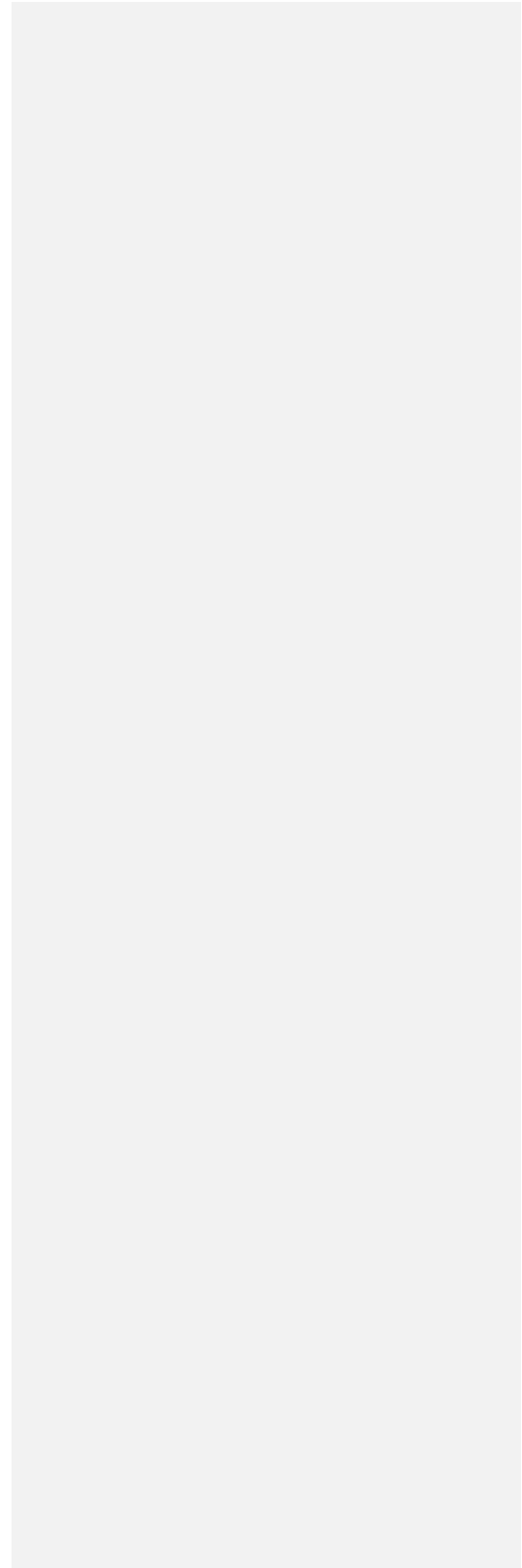
Appendix H

Meeting Reading Guidance Sheet



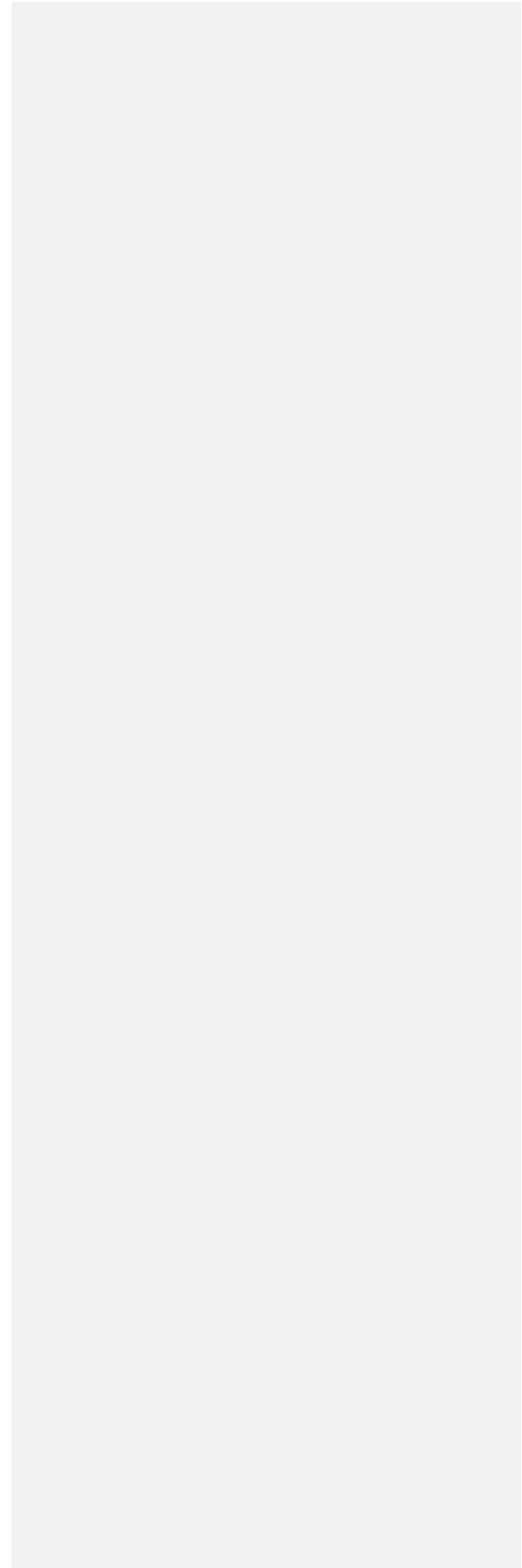
Appendix I

Typical Sewer Cleaning Work Order Form



Appendix J

Reportable Incident Form



Appendix K
CCTV Specification

