SECTION I – INTRODUCTION

1.1 Purpose of the Inspection

From June 26 to June 30, 2017, Allison Watanabe and I performed a public water system supervision inspection of the Camp Pendleton South public water system ("South System") and Camp Pendleton North public water system ("North System") to evaluate compliance with the Safe Drinking Water Act ("SDWA"). This inspection was performed under the authority vested in the Administrator of the United States Environmental Protection Agency, ("EPA") pursuant to Section 1445(j) of the SDWA 42 U.S.C. § 300j-4(b), to determine compliance with the requirements of the federal Safe Drinking Water Act ("SDWA"), 42 U.S.C. § 300f *et seq.* The inspections were conducted due to several complaints lodged against the Systems concerning operational and management capacity, and deficiencies with the finished water reservoirs.

1.2 Opening Conference

Sean McCarthy, South Coast Section Chief for the California States Water Resource Control Board – Division of Drinking Water ("DDW"), and Oliver Pacifico, DDW Santa Ana District Engineer, accompanied us during the inspections. At 12:30 PM on 6/27/17, we all met at Camp Pendleton's Main Gate visitor parking lot. Environmental Security ("EnvSec") staff met us at the parking lot and drove us to the Water Resources Department office for the entrance interview.

In the office, we met John Simpson, Director of the Water Resources Department ("WRD"), and Andrew Entingh, Director of the Environmental Security Department. The meeting also included the following Camp Pendleton personnel: Andrew Entingh; Ross Davis; Tracy Sahagun; and Mark Bonsavage (titles can be found on page 1 of the report). I presented my EPA-issued enforcement credentials to Mr. Simpson and filled out a Notice of Inspection for the South System. Mr. Simpson and Mr. Entingh signed the Notice of Inspection. I informed everyone present that EPA is conducting these inspections because of complaints regarding operations and management of the Systems, as well as concerns with reservoir deficiencies. I explained that the inspections are not sanitary surveys and will focus on elements of interest to investigate the validity of the complaints. I stated that we will focus on the South System on Monday, Tuesday, and Wednesday, while focusing on the North System on Thursday and Friday. This separation was to reduce confusion regarding information provided on both Systems.

Mr. Simpson prepared a presentation to provide an overview of the Systems and to provide some of the information I requested prior to the inspection. The presentation included basic maps and statistics, organizational charts, and the list of operators with their highest levels of operator certification. Paper copies of the System maps and schematics were provided.

Mr. Simpson stated that WRD is modeled after a standard water district and explained various obstacles for operating the Systems. One of the main obstacles is the lag in funding. If a construction project is $1M or more, then it will take a minimum of six years before they can obtain the funds from Congress and begin construction. He added that maintaining staff levels is difficult because WRD can only hire operators at approximately $20,000 less than nearby water districts and offers less desirable retirement plans. The systems do not currently have an operational SCADA system. WRD has struggled to install a new system due to cybersecurity issues discussed in more detail below. WRD plans to install a comprehensive SCADA system in approximately 1.5 years, with a total cost of ideally less than $3M. This is being funded using a portion of the budget that does not require congressional approval. Mr. Simpson explained that their more immediate solution is to purchase and install sensors so that the reservoir levels can be determined remotely. Until that time, operators must drive back and forth between reservoirs and booster stations in order to maintain reservoir levels.

Mr. Entingh described EnvSec akin to a Department of Environmental Resources. He explained that EnvSec currently does not have the expertise to evaluate the integrity of reservoirs, wells, and other drinking water apparatuses.

Mr. Simpson stated that operators can be working up to 12-hour shifts. Contractors are not helpful because the Systems do not have SCADA, unlike most other public water systems in the region. As a result, contractors do not understand how the Systems work. Mr. Simpson also stated that there are hurtles to hiring contract operators due to federal restrictions, and that contract operators are mainly used during emergency situations. He added that it is 1.87 times more expensive to temporarily hire a state operator, and that hiring state operators also fosters dissatisfied employees because of their higher pay and benefits.

Mr. Simpson and Mr. Davis described further operational issues. One operator manages both Systems at night. Due to lack of SCADA, an operator must visit every reservoir to check whether it needs filling and check every well to operate the pumps. As a result, a reservoir may be filled longer than needed, leading to overflow. Another issue may be two wells actively pumping, potentially leading to backflow concerns. During the day, a distribution operator monitors the reservoirs and wells, and records all important data in a logbook. This logbook is handed over to the next operator when a shift ends. I asked about who oversees the logbooks. Mr. Simpson stated that this was Mr. Art Mendoza, distribution system operator and D2 certified.

The Systems previously had partial SCADA capabilities but fell into disrepair for the following reasons: lack of maintenance; wildfires; and most importantly, the loss of accreditation by

military cybersecurity personnel. This SCADA formerly served up to ¾ of the South System. Mr. Simpson stated that the new, planned SCADA will have proper accreditation and that WRD will do everything to ensure it does not lose cybersecurity accreditation.

All sampling is handled by an outside contractor (CB&I Labs) and third party laboratories. Mr. Simpson estimated that $1.2M goes towards drinking water sample collection and laboratory analysis. Some laboratory analyses are further subcontracted to a couple of other laboratories. WRD occasionally collects random samples to confirm the validity of sampling and analyses by the contractors.

Mr. Simpson informed us that the Southern Advanced Water Treatment Plant ("Southern AWT"), which has reverse osmosis treatment and granular activated carbon treatment for high total dissolved solids ("TDS"), is currently down. He estimated that this treatment plant will hopefully be functional again by mid-July. In the meantime, all the water goes through an iron and manganese removal plant ("I&M Plant"). The I&M plant connected to the Southern AWT is also currently not operating due to filtering issues and lack of funds to spend on media replacement.

Drive to Reservoir Row

After the opening conference, Mr. Ryan Thresher, Ms. Erika Marx, and Mr. Reginald Holman, drove us to the top of "Reservoir Row", where a series of reservoirs are located along hilltops. This assisted EPA and DDW staff to understand the layout of the Santa Margarita Basin and where reservoirs, wells, and other important landmarks are located. I asked about basic information such as population served and number of connections. Ms. Marx stated that the information has not changed since the DDW sanitary survey conducted in March 2017. See page 6.

Mr. Holman explained that the first two digits on a building number for any building in Camp Pendleton indicates the area. The base is separated into numbered zones. Ms. Marx stated that logbooks are kept for each well and reservoir. She explained that someone is always managing the treatment plant in the South System, although it may have to close at night if not enough operators are available.

1.3 Facility/Site Description

The Systems, located just north of Oceanside in San Diego County, are owned and operated by the United States Marine Corps. Per the presentation provided by WRD, Camp Pendleton's two Systems combined include: seven watersheds, 4 aquifers, 22 wells, 34 reservoirs, two advanced

water treatment plants, two iron and manganese removal plants ("I&M Plant"), 8000 connections, and 400 miles of pipe.

South System

The South System is classified as a community water system serving 39,400 persons, though this number fluctuates depending on military personnel on site. California's public drinking water database, Drinking Water Watch, indicates that the System has 3,630 service connections. The South System is supplied by fifteen active wells, with an emergency interconnection with the City of Oceanside. The distribution system serves two distinct areas – water from the Santa Margarita Basin and the Las Pulgas Basin. Most the system and population served are located within the Santa Margarita Basin. The Las Pulgas Basin is separated from the Santa Margarita Basin although there is a pipe connecting the two if additional water is needed.

The Santa Margarita Basin has two I&M Plants. The effluent from the 24 Area I&M Plant subsequently goes through the Southern AWT, reducing TDS. The Las Pulgas Basin has one treatment plant that chlorinates and adds corrosion control treatment ("CCT").

Per DDW's most recent sanitary survey, the South System contains 25 finished water storage reservoirs with a combined capacity of 22 million gallons ("MG"). Mr. Simpson stated that there are currently 22 reservoirs for the South System. One of these reservoirs is an elevated storage tank.

Additional information may be found in DDW's sanitary survey of the South System, dated June 9, 2017 (See Appendix 5).

North System

The North System is classified as a community water system serving 15,600 persons, with this number dependent on military personnel on site. Drinking Water Watch states that the System has 942 service connections. The System has eight wells although only two are currently operational, and nine finished water reservoirs. The System serves the San Onofre area, as well as Areas 51, 52, 53, 61 and 62. The System chlorinates the water and adds CCT. It does not have any I&M Plants.

A northern Advanced Water Treatment plant is currently under construction that will centralize all treatment and management of the North System.

SECTION II – DAY 2 OBSERVATIONS (JUNE 27, 2017)

On Tuesday, June 27, 2017, EPA and DDW staff met EnvSec staff at 8:00 AM at the Camp Pendleton Main Gate parking lot. EnvSec drove us to the Facilities Maintenance Department (FMD) building to discuss the plans for each day and answer any questions before starting field visits. EPA, DDW, and Camp Pendleton staff followed this exact same procedure every day of the inspections.

At the FMD building, we met Art Mendoza and Allen Hollander. Mr. Entingh, Mr. Thresher, and Ms. Marx were also present the entire day. I asked Mr. Mendoza to explain the South System's chlorination treatment, and to explain the map and diagram provided the first day. The South System map indicated a couple of secondary chlorination stations. Mr. Mendoza explained that these stations were built to trigger if the chlorine residual was detected below 1.4 parts per million (ppm). They are no longer used because there were problems with over chlorination. Mr. Mendoza explained that pressure drops led to the chlorine analyzer pulling in air, which triggered false chlorine residual readings. This would trigger chlorination when it was not appropriate. These secondary stations have not been used for at least two years. The Las Pulgas side of the System has primary chlorination in the Las Flores area.

Mr. Mendoza stated that there are three entry points into the distribution system. Pressure is typically around 80-115 psi after treatment and that the goal is to maintain approximately 100 psi within the distribution system. One operator makes the rounds to each reservoir, booster pump, and well for the Santa Margarita portion of the South System. Another operator handles the North System and the Las Pulgas portion of the South System.

Mr. Hollander stated that all the required Title 22 drinking water monitoring is collected at the entry points and at the wells.

Mr. Mendoza stated that Reservoir 33710 is out of service. The goal for the steel tanks in Area 31 is to convert them to firefighting purposes only.

I asked Mr. Mendoza about his length of employment. He responded that he has worked for WRD for 9 years. His title is water distribution operator supervisor although he is not the "chief distribution operator", a position required by the DDW permit. Mr. Mendoza stated that there is currently no chief distribution operator.

I asked Mr. Mendoza to explain the logbook system for managing the Systems. He explained that each operator has a 10-hour shift. The first shift is from 0600 to 1600. The next shift is 1800 to 0400. There is technically a two-hour interval between each shift. Logbooks are passed from each

operator. If an operator is not able to physically hand over the logbook to the next operator, then the operator will write down notes for the next operator. On Wednesdays, there are two operators working during the day. The operator that is not out doing the routine run will go out to conduct inspections of each reservoir and well. Wells and booster stations have independently maintained logbooks. Reservoirs logbooks are not maintained.

2.1 Unity Room

The Unity Room is located within the FMD building. It monitors what remains of the old SCADA. It only monitors a couple of wells and reservoirs at this point. It cannot communicate with the treatment plants anymore.

The Southern AWT keeps a record of which wells are on and off. Mr. Mendoza stated that it is not possible or very difficult to detect chlorine events, reservoir overflows, or other similar issues due to the current method of operating the Systems.

2.2 Steel Tank 2491 and Booster Pump 2492

Mr. Mendoza explained that this storage tank's primary purpose is to feed Booster Station 2492 to help send water up into Reservoir Row. It has a capacity of 150,000 gallons. I was unable to observe the overflow because the overgrown brush obscured its location and limited access.

Booster Pump 2492 was rebuilt last year and is actively pumping 2-3 times per week. It is typically on for only a short period.

2.3 Reservoir 13154

I observed that the 5MG reservoir's vent screens did not appear tightened, forming small gaps that may allow pest intrusion into the reservoir. This was also identified in the March 2017 sanitary survey. Due to the nature of the roofing, rain water ponding was evident because of dried puddles of dirt. Mr. Mendoza explained that they inspect for water intrusion every three years due to ponding on the roof, but nothing is done in between. Mr. Mendoza was unable to locate the location of the overflow at the time of the inspection. The hatch door and the opening had a sanitary seal and did not have any noticeable issues.

2.4 Reservoir 13151

This reservoir has a capacity of 1.7 MG. The hatch door and opening appeared to be in good condition. The terminal point of the overflow was too far downhill from the reservoir to access. Mr. Mendoza stated that all the overflow endpoints have a flapper

valve or duckbill valve. Inside the reservoir, I observed a screen that appeared to be ¼-inch or less mesh was installed where the overflow pipe begins. The level gauge was functional. There was evidence of ponding on the roof of this reservoir. The mesh covering the vents was also not tightly fitted to the vent causing small gaps that may allow needs pest intrusion. This was also identified as an issue during the March 2017 sanitary survey.

2.5 Well 26071

Mr. Mendoza stated that the river is a couple of hundred yards away from this well. The 26 series well houses are all elevated approximately six feet high as they are located in a flood plain. The well vent was not downward facing and the vent mesh was coarser than the 24-mesh screens recommended by American Water Works Association standards. I observed that the well pump was leaking and was missing bolts in the well cap. Mr. Mendoza stated that the Southern AWT control room was still capable of operating this well. He then added that most wells can be controlled by the Southern AWT except for wells 26073 and 23093. I observed that the pressure at the well house read at 100 psi.

2.6 Well 26072

Mr. McCarthy noted that the hole for the well's electrical wire was not completely sealed. He also observed that the electrical box had three holes in the back that needs to be plugged. The well vent was downward facing and had a proper mesh size.

DDW's March 2017 sanitary survey indicated that the sample tap at this well was currently connected to the blow off piping and that the sample tap should be moved to the main discharge piping. Mr. Mendoza and Mr. Hollander explained that approximately 60% of the source samples are collected when the well is not running. They decided to not replace the check inlet, instead installing a sampling below the inlet for use when the well is actively pumping. They stated that this should resolve the issue of potentially sampling stagnant water.

2.7 Well 26073

When we arrived at this well, it was pumping water. I observed that the flow gauge indicated a flow of 1348 gallons per minute ("gpm"). The well seemed to be in adequate condition and nothing notable was observed. There was no leaking and it had a 24-mesh screen on the vent.

2.8 Reservoir 28150

I observed that the overflow screen inside the reservoir contained objects on top of it. This was also identified as an issue in the March 2017 sanitary survey. The reservoir hatch had a proper sanitary seal and appeared sufficient. The reservoir vent did not have a 24-mesh screen and was protected.

Mr. Mendoza stated that the "Miltronics" are not accurate at this reservoir. Miltronics is the brand name for the electronic measurement devices WRD has installed for the finished water reservoirs to determine reservoir volume. The reservoir log is only sporadically updated by contractors. I observed that the overflow had a flapper valve and was in good condition.

2.9 Southern Advanced Water Treatment Plant and 24 I&M Plant

This building is also called building 2470. The 24 I&M Plant is located with the Southern AWT. Water must be treated via the I&M Plant before going through the Southern AWT, otherwise the AWT will run into operational problems. We met Keith Regalado, treatment shift operator, at the Southern AWT, and we explained the various treatment processes located onsite.

Mr. Regalado explained that the 24 I&M Plant has been inoperable since March 2016 due to the formation of mudballs, lack of a functional purge system, and turbidity issues. The filtration tank was only cleaned every six months, while the manufacturer calls for more frequent cleaning. As a result, waste built up in the tank. Maintenance of the 24 I&M Plant did not receive adequate funding because regular cleaning was ranked as a low priority compared to many other funding necessities on Camp Pendleton. Detailed information regarding all the treatment processes may be found in the South System sanitary survey (see Appendix 5).

At the time of the inspection, the 24 I&M Plant was active and had begun start-up processes. Water was being treated by the 24 I&M Plant and then bypassing the Southern AWT until it is fully operational. Mr. Regalado hoped that the Southern AWT would also be operational in a few weeks.

Mr. Regalado stated that the Southern AWT has encountered operational issues since its construction in 2013. A new program called Factory Talk has been installed by ATSI (contractor) and should enable smoother operations. Currently, the treatment operators have little to no training on the program but ATSI is putting on training in approximately a month.

2.10 Interview: Murray Tomlinson

At the Southern AWT, we interviewed Murray Tomlinson, distribution operator. Mr. Tomlinson has been working for Camp Pendleton for 1.5 years, focusing on the South System. He works 10-hour shifts for four days a week. His shift is Sunday through Wednesday. He is a D4/T3 certified operator with 35 years of experience and reports to Mr. Mendoza.

Mr. Tomlinson drives from reservoir to reservoir to determine whether water must be added via the wells. He stated that he also monitors chlorine residuals when conducting site visits. Mr. Tomlinson typically starts in the Area 28, moves to Reservoir Road, and then to Areas 20, 32, and 33. He prioritizes visiting all wells that are actively pumping during his shift. He attempts to visit each reservoir every day although this may not always happen due to time constraints.

Mr. Tomlinson makes all his notes in the operator logbook. After his shift, the logbook is handed over to the next operator. Because of short staff, Mr. Tomlinson stated operators cannot focus on all job duties as well as they should. For example, operators are not always able to read pumping levels. He stated that there were five operator openings right now and it will soon be six because an operator is retiring very soon. He added that every operator on staff is at minimum D2/T2 certified.

I asked Mr. Tomlinson if he was chief distribution operator. He stated that he did not hold this position. I informed him that an email from WRD in DDW's sanitary survey indicated that he was chief distribution operator of the South and North System. He replied that this is first time he has heard he held this position.

2.11 Interview: Keith Regalado

After Mr. Tomlinson, we interviewed Mr. Regalado. Mr. Regalado is a shift treatment operator who began working for WRD in 2011. On a normal day of work, he said he would check the SCADA, walk through the treatment plants and check that everything is functioning correctly. He added that this is currently not his normal day as the treatment operators are focused on getting the treatment plants up and running first. He explained that the SCADA for the treatment plants still function because it does not require the cybersecurity accreditation that a system-wide SCADA would require.

Twice per day, Mr. Regalado completes an electronic "Go Form", located on a e-tablet, which evaluates various aspects of the treatment plant. He stated that the Southern AWT is usually staffed with two operators during the day, maybe three. At night, there is

one operator. There are two treatment shift operators and three treatment operators. The treatment plant is manned all hours of the day between six operators.

I asked Mr. Regalado about whether there was a chief treatment operator. He stated that there are currently no chief treatment operators and no treatment supervisors.

2.12 Sampling and Analysis

During conversations in the vehicle driving to the various locations, Mr. Allen Hollander stated that a contractor by the name of CB&I Federal Services collects all the drinking water samples. CB&I has been collecting samples on Camp Pendleton since 2005. CB&I has subcontracted laboratory analyses to EMAX. EMAX subsequently subcontracts analyses primarily to Eurofins, which analyzes approximately 95% of the samples. BSK analyzes perfluorinated compounds. Fruit Growers Laboratory analyzes radiochemical contaminants. All samples collected on weekends are sent to Enviro-Matrix.

For a short period, operators collected coliform samples. This practice was halted due to lack of operators available. Operators do not accompany the contractors during the process of collecting samples.

2.13 Security

Security for all sites visited during the inspections appeared satisfactory regarding vandals and intruders. I observed that locked fences surrounded all the water facilities. All buildings were locked.

SECTION III – DAY 3 OBSERVATIONS (JUNE 28, 2017)

Mr. McCarthy joined Ms. Watanabe and myself on Day 3. Mr. Pacifico had to return to the office to attend to other business.

3.1 Complaints

At the FMD building, I asked about the complaint system for the two Systems. Mr. Hollander stated that customer complaints go to Mr. Hollander, who then puts them into the monthly report to DDW. He estimated that 80% of the complaints are requests for bottled drinking water. WRD only provides bottled water if a certain area is not serviced by one of the two Systems. Most of the requests are denied.

Mr. Hollander stated that there was one incident of a customer falling ill. The military hospital investigated and conducted tests. The hospital concluded that the drinking water did not cause the illness.

Complaints are made to the FMD Customer Service phone line. A program called Maximo generates work orders based off the complaints. When an operator goes out to respond to a complaint, they always test for chlorine residual, taste, and smell. Mr. Hollander stated that the monthly reports to DDW include complaints, if we are interested in the record of complaints.

3.2 Incidents/Violations

I asked about any notable incidents within the five years. Mr. Mendoza explained that they started manning the South System with operators 24 hours per day approximately five years ago. The chief operator was on standby all hours of the day. WRD decided to have staffing 24 hours per day after an over-chlorination incident. A chlorine reader was faulty and was chlorinating all night even though water was not being pumped, and this error wasn't discovered until morning. Mr. Mendoza detailed that the chlorine residual was above 4 ppm at the far end of the South System. They had to flush from over 100 hydrants and partially dumped the finished water reservoirs.

Mr. Hollander stated that there were three total coliform detects in 2016. One in March at the South System, and two at the North System in July and September. WRD and DDW conducted L1 and L2 assessments, respectively, as required by the Revised Total Coliform Rule, but were unable to determine the source of the coliform detects at the North System.

Mr. Hollander also mentioned that the South System had a total trihalomethane MCL violation in 2016. A rigorous flushing program was implemented at the site and at other dead end mains, with auto flushers installed in the problematic areas. This flushing program has contained the disinfection byproduct levels. Mr. Hollander stated that there was triggered groundwater monitoring violation but this was quickly resolved after DDW explained the monitoring requirements.

3.3 Maintenance

Mr. Mendoza explained that reservoirs are inspected every month. Drain valves are exercised every quarter. He noted that a couple of drain valves are broken shut. WRD has a valve equipment truck to do routine valve exercising but not enough operators to

use the truck. The truck is brand new and has not be used yet. There is no formal valve exercising program.

I asked about whether there is any quality assurance or quality control ("QA/QC") mechanisms for the System operations. Mr. Mendoza stated that there previously was a QA/QC staffer who would check logbooks and check reservoirs, wells, and pumping stations. He no longer works at Camp Pendleton and no replacement was hired.

In the event of an emergency, Mr. Mendoza is the person contacted to deal with any situation that arises and makes operational decisions at that time. Mr. Mendoza stated that there are eleven distribution operators.

3.4 Reservoir 43610

The reservoir is 0.5 MG concrete tank. In the DDW sanitary survey, it was pointed out that the access road had eroded to the point that the overflow piping was visible. I observed that the road was fully repaired. The overflow had a flapper valve and appeared to be in decent condition. The nearby hillside was eroding with dirt gathering near the base of the reservoir. The March 2017 sanitary survey identified this deficiency. WRD has not implemented any measures to mitigate the potential effects of erosion as they were still awaiting funds for this project.

The overflow screen located inside the reservoir had debris located on top of the screen. Mr. Mendoza stated that most of the large pieces of debris have been removed. After the inspection and upon further review of the photograph of the debris back in the office, the unidentified debris appears to be three dead animal carcasses (possibly mice). On July 19, 2017, I emailed Mr. Simpson and Ms. Sahagun about the dead animals in the reservoir. Mr. Simpson stated on the phone later that day that they had cleaned the reservoir.

The level gauge and Miltronics are not functional. The operators determine the level by opening the hatch and making approximations. The vent screen was facing upwards with a coarse mesh.

3.5 Booster Pump Station 43310

The pump station housed three pumps. A diesel Kohler power system is used to provide power. The logbook appeared be up to date. The booster pumps appeared to be in decent condition.

3.6 Reservoir 43210

I observed that there were floating debris on the top of the finished water. Mr. Mendoza stated that they are silica bits likely from the wells. They are not sure why the bits are showing up but they are not believed to be harmful. The vent is upward facing with a coarser mesh than AWWA standards. The divots formed by the corrugated steel roof and the reservoir vent are not all properly sealed. The plugs installed in some of the vents have fallen into disrepair. This may allow for pest intrusion into the reservoir. This reservoir's Miltronics are functional but does not connect with the SCADA.

Mr. Mendoza stated that the corrugated steel divots all have a rubber seal installed and then covered in a foam sealant as well. I checked the logbook and confirmed that it only had a few entries and is not maintained.

I observed that the overflow was in good condition with a flapper valve installed. The aluminum roof had evidence of ponding. Mr. McCarthy also observed that the aluminum wall paneling was loose in various spots.

3.7 Well 410621

Mr. Mendoza stated that this well replaced Well 4621 approximately 10-15 years ago. The well base does not have a annular seal. The well cap has holes due to missing bolts. The sealant around the electrical cord that leads into the well needs to be repaired. There were also insects around the well base. Mr. Entingh stated that this well was not used for a long time due to detects in gross alpha and chromium. They began using the well again in December 2016.

3.8 Well 41611

When we visited this well, we met John Reynolds, operator, who was doing the routine distribution operator run. Mr. Reynolds stated that he manually turned on the well. I asked about how he determined that the well needed to be turned on. He replied that Reservoirs 43210 and 43610 were 80% and 90% filled, respectively, and needed to be filled up to 95%. Based on his calculations, he stated that the well needed to be running for 100 minutes. He guessed that this well is typically run for 2-4 hours per day.

Ms. Watanabe observed that the well vent had some unknown object located inside the mesh area and that the mesh screen was too coarse. I observed that the well base needed an annular seal. The well pump was leaking. Mr. McCarthy noted that the pump pedestal was lower than the recommended 18-inches.

I observed that there was a bee infestation outside of the well house. This poses a safety risk to operators who must visit this well house every day. There were also birds nesting under to well house eaves.

3.9 Chlorination Station 410618

We encountered Mr. Reynolds again at the chlorination station. Mr. Reynolds stated that after turning on Well 41611 he then comes to this chlorination station as it must be activated manually. The automated chlorine feeder was down at the time of the inspection. Mr. Reynolds explained that he watches the chlorine residual reader until it reaches the desired level of 1.75 – 2 ppm. I observed that the salt used for the brine was NSF-certified.

Mr. Reynolds stated the water softener at the beginning of the treatment process is always on. It must be replaced approximately every three weeks. I observed that the chlorine reader displayed a chlorine residual value of 1.70 ppm and pH of 7.32. I observed that the brine tank had an opening at the top for the feed line, and that this opening was simply covered with a towel. When the brine tank's top was opened, I observed a couple of insects ran to hide in the piles of salt.

Mr. Reynolds collected a grab sample for the chlorine residual to check the accuracy of the automated chlorine reader. He registered a chlorine residual of 2.07. Mr. Reynold informed Ms. Watanabe and I that the grab sample is accurate and that the automated chlorine reader has been inaccurate lately.

I asked Mr. Reynolds about his work duties. He stated that he has been an employee for two years and mostly focuses on the North System. He also covers the Las Pulgas portion of the South System during his shift.

3.10 Interview: Phillip Sipes

At the Southern AWT, Ms. Watanabe and I interviewed Mr. Sipes with only Mr. McCarthy present. I asked other Camp Pendleton representatives if they could grant us privacy during the interview.

Mr. Sipes stated that he was a shift operator and has been working for Camp Pendleton for 8.5 years. He has been acting treatment supervisor since November 2016 and is going to be appointed treatment supervisor very soon. He indicated that even when he becomes treatment supervisor, this is not the same title as chief treatment operator. As

there is no chief treatment operator, Mr. Sipes reports to Mr. Davis. In the case of an emergency regarding the treatment plants, Mr. Sipes is the point of contact.

I asked Mr. Sipes about his normal duties. He responded that he delegates a lot of the work so he can focus on monthly reporting, creating purchases orders and requests, certifying payroll, and providing training to staff. Mr. Sipes supervises five operators, two laborers, and two pool operators. Mr. Sipes works with two other treatment operators on Monday, Tuesday and every other Wednesday. All the other day typically have 1-2 operators.

Mr. Sipes stated that only one operator works during the day on Friday and Saturday. I asked Mr. Sipes how many operators the treatment plants should have, in his opinion. He replied that during the day, the South System should have at minimum three treatment operators and the supervisor. He added that one treatment operator for the North System was likely enough.

Mr. Sipes explained that the Southern AWT has had problems since its inception. The treatment operators have completed a lot of remediation and troubleshooting so the Southern AWT and I&M Plants should be running much better in the future. WRD has a contract with Hach to calibrate their equipment annually.

Mr. Sipes explained that all the operator positions at Camp Pendleton are hired as treatment operators. Two years ago, the operators were split into distribution operators and treatment operators in terms of job duties. Treatment operators work 12-hour shifts to ensure that the Southern AWT is manned 24 hours a day. Mr. Sipes stated he works 10-hour shifts. When operators have 8-hour shifts, they commonly end up doing 12-hour shifts out of necessity.

I asked about checking chlorine residuals at the treatment plant. Mr. Sipes explained that they collect grab samples using a Hach SL1000, which stores all the data collected and is uploaded into a computer. A residual is collected in the morning and a couple of times per shift. In addition, the required chlorine residual monitoring is collected during each shift.

I asked Mr. Sipes if he has observed anything unusual during his employment at Camp Pendleton. He replied that WRD used a former employee's name and certification to fill a required position even though he was no longer employed by WRD for over six months.

I asked Mr. Sipes about whether autodialers have been set up. He explained that the autodialers for the Southern AWT and I&M Plant are hooked up to the Southern AWT SCADA room and rings in the room. The plan is for the autodialers to call the Southern AWT cell phone but this has not been set up yet.

I asked Mr. Sipes about operators employed by WRD. He replied that WRD typically hires older men who commonly are retired and are not amenable to working weekends or hires people would not make it at any other water system. This is because Camp Pendleton cannot attract the best operators due to the compensation offered in comparison to other public water systems.

3.11 Well 330924

Mr. Hollander stated that Camp Pendleton received a permit amendment for this well a couple of years ago and that this well was replaced two years ago. I observed that the well was running at the time of the inspection. The well vent was not downward facing and a seal should be applied at the base.

I asked Mr. Mendoza about how the well was activated. He replied that this well can be turned on from the Southern AWT SCADA. A distribution operator will come to the well to fill out the paperwork.

3.12 Well 23001

I observed that the well vent was not downward facing. There was a sizable amount of water on the ground of the well house and below the well house (the well house was elevated due to its location in a flood plain). The source of the leaking was from the well pump, possibly from the well's drain pipe. I observed that the well case sealant was cracking.

3.13 Reservoir 20813

The reservoir has an aluminum roof and was constructed approximately two years ago. The reservoir was not functional until the last six months. I observed that the hatch and hatch door were adequate and that the finished water appeared clear. I observed that the mesh for one of the vents had a gap in it that could allow pest intrusion. There was evidence of some ponding on the roof. This was identified as a potential issue in the March 2017 sanitary survey.

Mr. McCarthy observed the overflow when Ms. Watanabe and I were inspecting the reservoir. He stated that the overflow had a flapper valve and appeared to be in good condition.

SECTION 4 – DAY 4 OBSERVATIONS (JUNE 29, 2017)

Ms. Watanabe and I met James Jablonski, DDW engineer, at the parking lot before heading to the FMD office. Mr. McCarthy and Mr. Pacifico did not attend Day 4 as they had to attend to other business. At the office, I explained that we would begin inspecting the North System today and that Ms. Watanabe would be leading most of the questions. I presented Mr. Entingh my EPA-issued enforcement credential and issued the Notice of Inspection. Mr. Entingh and Mr. Davis jointly signed the Notice of Inspection. Mr. Mendoza, Ms. Marx, Mr. Thresher, and Mr. Hollander were present for the meeting.

Ms. Watanabe asked about the operator situation for the North System. Mr. Mendoza replied that there is no chief distribution or treatment operator, although he still serves as operator supervisor. The North System had no shift operator at the time of the inspection. The one operator during the day who manages the North System also manages portions of the South System – the 41 Area and the LCAC (Landing Craft Air Cushion). Mr. Mendoza stated that all operators that work in the North System hold at least a Distribution 2 (D2) certification and a Treatment 2 (T2) certification. The following operators work on the North System: John Reynolds and Bruce Kilgore. An additional T2 certified operator – Mike Gill, also works periodically in the North System.

Ms. Watanabe asked about standard operating procedures ("SOP") developed by WRD. Mr. Hollander stated that they are working on new SOPs although they are still in draft form. He stated that he would provide the currently approved SOPs to EPA. These SOPs cover both Systems. I asked about an emergency response plan. Mr. Hollander replied that this is included in the SOP documents. Mr. Mendoza also explained that he is called during any emergency.

Ms. Watanabe asked about the backflow prevention program. Mr. Hollander stated that a contractor called LTS handles the backflow prevention program. The backflow testing is conducted annually. Cross connection tests are conducted every three years. LTS also manages the hydrant flushing program. According to Mr. Hollander, hydrants are flushed every quarter. Mr. Jablonski asked about hydrant flushing frequency due to the drought. Mr. Hollander stated that flushing frequency has not been affected by drought conditions.

Mr. Hollander explained that the annual report to DDW includes reservoir cleaning dates. He stated that he would also provide a list of reservoir cleaning dates for both Systems to EPA. Ms. Watanabe also asked whether they had a valve exercising program. Mr. Mendoza stated that there was no valve exercising program for the North system. He stated that they have a valve truck, but insufficient personnel to operate it.

Ms. Watanabe asked about how WRD manages its infrastructure assets and improvements. Mr. Hollander and Mr. Entingh replied that in terms of managing assets, Camp Pendleton is drafting a main evaluation which will feed a capital improvement plan in the future. They acknowledged that this did not include assets such as reservoirs. WRD and FMD are currently reviewing the plan. Mr. Entingh explained that they are reactive to any fixes required to maintain the Systems and that there is no comprehensive plan to manage infrastructure maintenance/replacements. He added that it can take approximately two years to replace a well. EnvSec may access a separate fund from the usual Congressional appropriations to make water system upgrades. These funds take less time to access than the lengthy Congressional process.

Ms. Watanabe asked about SCADA capabilities for the North System. Mr. Mendoza explained that a couple of booster stations can sometimes be controlled remotely from the Unity Room. Mr. Jablonski asked about the chlorination and CCT stations. Mr. Mendoza replied that these stations cannot be controlled via SCADA.

Ms. Watanabe asked for an explanation of the North System's operations. Mr. Mendoza state that a northern AWT is currently under construction. When completed, the northern AWT will be a centralized point for chlorination, CCT, and fluoridation. They hope to have the northern AWT functional by late 2018. The System has two operational wells: 610521 and 610511. Water from these two wells can go in two directions.

All the San Onofre wells have been down for two years. Two of these wells are down due to air entrainment issues causing chlorine residual analysis issues and chlorine feed issues. Two of the old wells were replaced with new wells but still have air entrainment issues that have not been resolved. A study is currently underway to identify the problems and repair the wells. Otherwise, these wells are out of service an indefinite amount of time. Well 55030 also has high iron levels.

Mr. Mendoza stated that Well 620620 is out of commission due to missing parts and repairs have not been made yet. Well 61531 has been inactivated and is no longer permitted for use. Mr. Mendoza stated that the autodialers in the North System are not operational.

Mr. Mendoza stated that the System has enough flow right now from the two wells. WRD is hoping to connect the North System to San Clemente's water system in case of emergency. In the summer, there are occasionally water supply concerns. In addition, WRD is constructing an emergency line between the North and South System.

4.1 Treatment Plant 610512

After the entrance briefing for the North System, we all drove to a fenced compound that houses multiple drinking water buildings (buildings described in Sections 4.1 – 4.4). Mr. Mendoza informed us that chlorination turns on automatically based on detecting flow. The chlorine tank alarms are not functional and should alarm to the Unity Room. In the future, the goal is to have alarms contact the South and North AWTs. The plant has two chlorine feeders, one fed with water from the 61514 booster pump station and one fed by the 61513 booster pump station. I observed that the 61514-affiliated chlorine feeder was locally run while the other feeder was automated. Mr. Mendoza was unsure of the reason for this discrepancy. Mr. Mendoza stated that the goal for disinfectant residual was 1.7 mg/l. The transducers were working so there were accurate tank level readings which are used for the dosage rate. The target for phosphoric acid is 1 PPM in the system.

During the inspection at 610512, a contractor named Chris visited the building to conduct CCT maintenance. Chris stated that he comes by at a minimum of once per week. I did not get the contractor's last name.

Mr. Mendoza stated that this treatment plant was built twelve years ago and it runs approximately 18 hours/day. The CCT equipment was installed 8-9 years ago. Phosphoric acid treatment is located at each well house. Sodium hydroxide is added at one location, after the well pipes have combined into one line.

4.2 Booster Pump Station 61513

Mr. Mendoza explained that only two of the three pumps at the station are active at any given time. The logbooks are kept up to date at the booster pump stations and these logs are used to determine usage. These booster pumps are typically turned on manually and pump 1100-1200 gpm. Each pump has 550 maximum flow and the pumps either function at maximum power or are off.

4.3 Well 610511

Mr. Mendoza stated that this well pumps 1100 gpm and was installed more than twelve years ago. The source water does not have iron and manganese issues or any other MCL

contaminants, although it has slightly elevated TDS levels. The water is drawn from an unconfined aquifer.

At this well, we encountered Mr. Reynolds again as he was working. I observed him turn off the well manually at 11:30 AM. When I was reading the well logbook, I observed that Mr. Reynolds put 11:00 AM as the time the well shut off.

The well vent and casing did not appear to have any issues. The well house included a phosphoric acid pump, while the phosphoric acid storage tank was located just outside the well house.

I asked Mr. Mendoza about pressure levels for the North System. He said pressure ranges from 30-80 psi. It is around 30 psi at the top of the hill.

4.4 Booster Pump Station 61514

The booster pump station houses three booster pumps, which feed the Area 51 reservoirs. Mr. Mendoza stated that, similar to Booster Pump Station 61513, only two of the three pumps are activated at any given time. Each pump can handle 550-600 gpm. The information plate on one of the pumps stated that these are centrifugal pumps with 1750 RPM, and has a head of 265 feet.

4.5 Reservoir 51770

Reservoir 51770 was in the same fenced compound as Reservoirs 51771 and 51772. Mr. Mendoza stated that it is a 0.5 MG concrete tank that is very old and that they are hoping to replace at some point. Ms. Watanabe and I observed that the hatch door was not adequate for numerous reasons: instead of a shoe-box lid, it is a wooden door along the wall; and the door is in poor condition and fails to form a complete seal along all the edges. We observed ants crawling into the reservoir from the gaps formed between the hatch door and door frame. Ms. Watanabe observed numerous rust holes in the reservoir wall. The hatch doors used to also function as the reservoir vent as there was a screen installed into the wooden door. These insufficient vents were boarded up after a past sanitary survey identified them as deficiencies. No new vent has been installed for the reservoir. Inside the reservoir, there was considerable debris at the entrance. It was too dark to evaluate the finished water. The metal siding was also loose. The overflow was capped and did not appear to have any issues. Mr. Mendoza stated that the Milltronics for this reservoir were currently working, but it only functioned locally.

4.6 Reservoir 51771

This reservoir has a capacity of 1 MG and is also a concrete tank with an aluminum roof. Ms. Watanabe and I did not observe any issues with the hatch and the finished water appeared clear. We observed that the vent was upward facing and the vent mesh was not fine enough. There was a spider observed in the vent. The divots created between the corrugated roof and the vent were not all sealed. There was water leaking at a few points along the concrete wall, starting where it transitions into the aluminum roof. Mr. Mendoza was unsure of the reason although it is likely from condensation forming inside the reservoir.

Mr. Mendoza stated that the overflow for 51771 and 51772 may be connected, although he was not sure about this fact. The overflow was difficult to access due to heavy brush. This brush harbors ticks, which pose a health hazard to operators trying to inspect the overflow. The overflow had a duckbill valve that was continuously leaking water. Mr. Mendoza explained that the drain valve, which connects to the overflow pipe, is permanently stuck slightly open. As a result, water is constantly wasted. The overflow valve was almost flush to the ground and had weeds growing around it.

4.7 Reservoir 51772

Reservoir 51772 also has a 1 MG capacity with a concrete base and aluminum roof. Ms. Watanabe and I observed that the hatch did not have a shoe-box style lid – instead it was flush against the roof surface. The liner was coming off from the concrete inside the reservoir. The reservoir vent had a very wide mesh and it did not have adequate protection such as a mushroom cap from rain and other airborne materials.

Ms. Watanabe observed a crack in the rooftop seam. She also noted that bolts were missing in various spots, creating holes into the reservoir. I observed ants crawling into the reservoir via a crack in between the concrete wall and aluminum reservoir. Mr. Jablonski observed that there was a sizable gap between the wall and roof at another location of the reservoir.

4.8 Well 610521

Mr. Mendoza stated that this well has the same age as Well 610511. It also has the same set up for phosphoric acid treatment for corrosion control purposes. Ms. Watanabe observed that the well vent was not downward facing. Mr. Mendoza stated that the well level meter is not accurate.

SECTION V – DAY 5 (JUNE 30, 2017)

Mr. Pacifico and Mr. Jablonski joined Ms. Watanabe and myself for the last day of Ms. Watanabe asked about recent total coliform positive hits. At the FMD office, Mr. Hollander explained that the North System had two total coliform detects in 2016, triggering a Level 1 and Level 2 assessment. The sites for the two total coliform events were different. After the Level 1 assessment, WRD decided to take sample taps off and instead carry around disinfected sample taps when it was time for sampling. After the Level 2 assessment by DDW, the sample taps were installed back to normal. DDW and WRD were both unable to identify the source for the coliform detects.

Ms. Watanabe asked about public notice procedures. Ms. Marx stated that public notices goes electronically to the adjutant, area commanders, base housing, the base school authority, and the Marine Corps Community Services (this includes vendors such as fast food restaurants and the commissary). Each of these departments subsequently issue the public notices to residents and/or post the notices in public places. Mr. Entingh added that if the nature of the violation only affects certain portions of the water system, then the public notice will only be provided to affected areas on base.

Ms. Marx stated that the consumer confidence reports have the same distribution method as the public notices. The North and South consumer confidence reports are sent to the entire base as one report. She also stated that the CCR is reviewed by the commanding general's chief of staff prior to release.

5.1 Reservoir 62310

Mr. Mendoza stated that the level gauge and Miltronics are functional at this reservoir. Ms. Watanabe observed that the vent was upward facing and did not have a 24-mesh screen. Unlike the other upward facing vents, this vent also had a seal along the base where rain water might have exited. This seal may make the vent susceptible to rain flooding the vent. There was some moss growing in a seam on the roof. There were two holes in the reservoir wall siding. A hole that penetrated directly to the reservoir was also found in the August 2015 sanitary survey, but Mr. Mendoza showed us where they had fixed it. The overflow had a flapper valve and appeared in good condition. Mr. Mendoza stated that they do not have the "as-builts" for most of the reservoirs. He also stated that this reservoir log book is not up to date.

5.2 Reservoir 63210

Ms. Watanabe observed a dead frog inside the reservoir, on the ladder leading into the reservoir. The frog appears to have been dead for a considerable length of time as it was

completely desiccated. Mr. Mendoza removed the frog with his hands soon after identification. A live frog that was observed inside the reservoir was identified as an issue in the August 2015 sanitary survey. Ms. Watanabe observed that the reservoir had the upward facing vent with coarse mesh similar to many other reservoirs. She also noticed several holes in the reservoir formed from missing bolts in the roof and loose bolts in the siding. There were also gaps between metal plates in the siding. There were also cracks in the seams (sealant) along the roof and wall.

I observed that a nearby hill was eroding and piles of dirt were very close to the reservoir.

Mr. Mendoza stated that the Miltronics are functional but the physical level gauge is broken. Mr. Mendoza stated that he searched for the overflow's location 2-3 weeks ago but he could not find it due to excessive brush.

5.3 Reservoir 52698

This reservoir has a geodesic dome roof placed on top of a concrete base. Mr. Mendoza stated that he was not sure when the reservoir was constructed, but the roof was added about four years ago. He stated that the Milltronics were not working. Ms. Watanabe and I observed gaps along the junction point between roof and concrete. We observed that the two hatch doors did not have a sanitary seal along all the edges, meaning that a full sanitary seal was not formed for the hatches.

I observed that a dead rodent was located inside the reservoir's finished water. Mr. Thresher and Ms. Marx confirmed that it appeared to be a rodent. I also observed that the one of six vents at the top was missing a plug at the top of the vent roof. There was evidence of ponding on the roof panels. After the inspections, I learned that the rodent was removed, and that the reservoir was emptied and super chlorinated.

We were not able to access the overflow due to overgrown bushes. Mr. Mendoza explained that the drain connects to the overflow. He noted that the drain valve is currently stuck in an open position.

5.4 Reservoir 53116

Ms. Watanabe and I observed that the seals for the hatch were in good condition. The overflow vent inside the reservoir had some minor debris on top. The interior of the concrete tank and the wall had minor cracks. All nine reservoir vents were in good

condition. Due to the geodesic dome roof, there was minor ponding on the roof after rain events.

Ms. Watanabe observed holes where bolts should be, creating holes into the reservoir. She observed that the overflow had a flapper valve that was properly constructed. A vent was located immediately behind the flapper valve as well.

SECTION VI – AREAS OF CONCERN

Closing Conference

The exit interview included the following individuals: Mr. Pacifico, Mr. Jablonski, Mr. McCarthy (via phone), Ms. Marx, Mr. Davis, Mr. Paull, Mr. Thresher, and Mr. Entingh. Mr. Simpson was unable to attend due to a medical appointment. During the conference, I explained EPA's SDWA enforcement process and that this inspection report would take approximately three months before release to Camp Pendleton. For the remainder of the conference, I went over any initial findings from the inspections. The comprehensive list of findings can be found below.

The presentation of areas of concern does not constitute a formal compliance determination or violation. Recommendations are primarily based on EPA's *Sanitary Survey Guidance Manual for Ground Water Systems, October 2008*.

Regulatory Concerns – Operations and Management

1. The Systems did not have a chief distribution operator and chief treatment operator.
2. In the August 2015 North System sanitary survey, DDW noted that Camp Pendleton was noncompliant in that the system lacked a chief operator and shift operator. The systems continue to lack a chief operator, yet none of the position descriptions provided are for a chief operator.
3. Managers acknowledged that the congressional approval process for receiving funding for large capital improvement projects means that funding can take six years, but there were no comprehensive plans for managing and budgeting for future infrastructure replacements, such as asset management plans and capital improvement plans. Management also acknowledged that they are reactive in maintaining/ replacing infrastructure.
4. The operator logbook does have any consistent practices for entries. For example, it is not clear when time entries are for when an operator arrives at a site, is about to leave a site, or if the time logged is for when an activity is completed.
5. Monthly and quarterly reservoir inspection logs were not always completed. In addition, not all reservoirs appear to be inspected at the frequency required by the state permit.

6. There are not enough operators to manage all aspects of the two Systems. For example, the shift operator for the North System must also handle part of the South System during his rounds. In addition, there are not enough operators to implement a valve exercising program.
7. Autodialers are not fully functional at most locations. The alarms only go off in the immediate area instead of calling an operator or alerting a centralized system such as SCADA. This also places additional workload on operators.
8. The location of overflows is not always known or are inaccessible, making it unlikely that they are being inspected during monthly and quarterly reservoir inspections required by the state permit.
9. Operators have indicated that Reservoir 20815 (an elevated tank) is in poor condition so an inspection may not be feasible.
10. Some issues that were listed on the sanitary survey were either unaddressed or recurring problems.
11. The June 2017 SOPs for cleaning reservoirs indicates that all reservoirs should be cleaned once every three years. According to the reservoir cleaning log, some reservoirs were not cleaned on a three-year schedule and some reservoirs had not been cleaned since 2009. For example, Reservoir 43610, which had dead rodents on the internal overflow mesh, had not been cleaned within the last three years.

Regulatory Concerns – South System Infrastructure Assets

Reservoir 2491	The location of the overflow was unknown at the time of inspection.
Reservoir 13154	• The location of the overflow was unknown at the time of inspection. See Appendix 1, Photograph 1. • The vent screens were loose and needs tightening. See Appendix 1, Photograph 2. • There was evidence of ponding on the roof.
Reservoir 13151	• The roof of the reservoir accumulates ponds of rain water. See Appendix 1, Photograph 3. • The vent screens were loose and needs tightening.
Well 26071	• The well vent was not downward facing. • The well vent did not have a 24-mesh screen. • The pump was leaking. • The well cap was missing bolts. See Appendix 1, Photograph 4.
Well 26072	• The electrical box had three holes in the back. See Appendix 1, Photograph 5. • The seal around the electrical line requires repairs. See Appendix 1, Photograph 6.

Reservoir 28150	• The overflow screen within the reservoir had some debris stuck on top. • The reservoir vent did not have a 24-mesh screen. See Appendix 1, Photograph 7.
Reservoir 43610	• The overflow screen within the reservoir had some debris stuck on top. This debris appears to be animal carcasses and should be removed immediately. See Appendix 1, Photograph 8. • Both the physical level gauge and electronic gauge were not functional. • The vent did not have a 24-mesh screen. • The vent should not be upward facing. See Appendix 1, Photograph 9. • Measures for mitigating erosion problems near this reservoir have not been implemented due to funding.
Reservoir 43210	• The vent did not have a 24-mesh screen. • The vent should not be upward facing. • The divot plugs to fill the gaps between the corrugated roof and the vent need repairs. See Appendix 1, Photograph 10. • The roof of the reservoir accumulates ponds of rain water. • The aluminum wall paneling is loose in some locations. See Appendix 1, Photograph 11.
Well 410621	• The base of the well pump needs an annular seal. See Appendix 1, Photograph 12. • The well cap is missing a couple of bolts, creating holes into the well. • The hole for the electrical wire needs to be re-sealed. • Pests near the well.
Well 41611	• An annular seal should be installed along the base of the well pump. See Appendix 1, Photograph 13. • The pump exhibited minor leaking. • The pump pedestal appears to be below 18-inches. • The well vent did not have a 24-mesh screen. See Appendix 1, Photograph 14. • The well vent seemed to have an object located within it. • There was a bee infestation along the exterior of the well house, posing a security risk to operators. • There were birds nesting under the eaves of the well house.
Treatment Plant 410618	• The towel covering the opening in the brine tank was not preventing pest intrusion. See Appendix 1, Photograph 15.

	• Small insects were observed scurrying around in the brine tank. • The chlorine residual analyzer was inaccurate.
Well 330924	• The vent was not downward facing. See Appendix 1, Photograph 16. • A seal should be applied at the base. See Appendix 1, Photograph 17.
Well 23001	• The vent was not downward facing. • The well pump was leaking. See Appendix 1, Photograph 18. • The seal at the base of the well casing was cracking and needs re-sealing.
Reservoir 20813	• The roof of the reservoir accumulates ponds of rain water. • There is a gap between the mesh and the vent.

Regulatory Concerns – North System Infrastructure Assets

Reservoir 51770	• The hatch door did not have a shoebox lid design. See Appendix 2, Photograph 1. • The hatch door was constructed of wood and did not form a sanitary seal with the door frame. • Ants were crawling into the reservoir via the hatch. Lots of debris were littering within the hatch entrance. • The wall had various rust holes. See Appendix 2, Photograph 2. • The reservoir did not have a proper vent installed. • The siding of the wall was falling apart in some locations, with many bolts missing. See Appendix 2, Photograph 3.
Reservoir 51771	• The vent was upward facing. • The vent screen was not 24-mesh. • Inspectors observed insects living within the vent. See Appendix 2, Photograph 4. • The concrete wall had a couple of cracks. • Some of the divot plugs between the corrugated roof and the vent need repairs. See Appendix 2, Photograph 5. • Condensation appeared to be forming within the reservoir and dripping out along the side of the concrete walls. See Appendix 2, Photograph 6. • The overflow's duckbill valve was flush against the ground with brush growing around it. The valve should be elevated at least 12 inches above the ground. See Appendix 2, Photograph 7.

Reservoir 51772	• The liner within the reservoir was coming off the concrete. • The hatch entrance was flush with the roof. It did not have a shoe box lid. See Appendix 2, Photograph 8. • The vent screen was not 24-mesh. See Appendix 2, Photograph 9. • The vent did not have proper protection, such as a mushroom cap, from rain and airborne materials. • The roof had a crack, creating a gap into the reservoir. See Appendix 2, Photograph 10. • The wall was missing some bolts, creating holes into the reservoir. • Inspectors observed ants crawling into a hole leading into the reservoir. See Appendix 2, Photograph 11. • The roof and wall was coming apart in one location, creating a large gap. See Appendix 2, Photograph 12.
Well 610521	The vent was not downward facing.
Reservoir 62310	• Reservoir needs maintenance as previous repairs and wearing down. See Appendix 2, Photograph 13. • The vent was upward facing. • The vent did not have a 24-mesh screen. • The vent was sealed at the bottom in a way that may have encouraged rain intrusion into the vent. See Appendix 2, Photograph 14. • There was moss growing in the seams between the roof panels. See Appendix 2, Photograph 15. • There were two holes in the siding, one of which went directly to the reservoir. • The overflow was not easy to access for operator inspection. There is no trail and considerable brush in the path.
Reservoir 63210	• A dead frog was found inside the reservoir, on the ladder leading down to the water. See Appendix 2, Photograph 16. • The overflow was inaccessible due to excessive brush blocking the path. • The vent did not have a 24-mesh screen. • The vent was upward facing. • There were gaps in the metal siding and holes created by loose bolts. See Appendix 2, Photograph 17. • The roof was missing bolts in some locations, creating holes into the reservoir. See Appendix 2, Photograph 18.

	• There was erosion from a hill, bringing dirt piles right next to the reservoir. See Appendix 2, Photograph 19. • There were cracks in the seal along the roof and wall. See Appendix 2, Photograph 20.
Reservoir 52698	• A dead mouse was located inside the finished water of the reservoir. See Appendix 2, Photograph 21. • The connection between the concrete base and metal roof had gaps. A seal should be applied along the entirety of connection. See Appendix 2, Photograph 22. • The overflow was inaccessible for inspection due to excessive brush. • One of the vents was missing a plug on the roof, creating a hole into the reservoir. See Appendix 2, Photograph 23. • The hatch doors only had a partial sanitary seal. A seal needs to line the entirety of the hatch door. See Appendix 2, Photograph 24. • The drain pipe is permanently stuck slightly open, leading to a constant leak through the overflow pipe.
Reservoir 53116	• The overflow vent located within the reservoir had a minor amount of debris on it. • The concrete wall and the concrete interior of the reservoir had cracks. See Appendix 2, Photograph 25. • The roof of the reservoir accumulates ponds of rain water. • There were holes in the wall where bolts should be. See Appendix 2, Photograph 26.

SECTION VII – DOCUMENTS RECEIVED DURING THE INSPECTION

During the inspection, Ms. Watanabe and I requested and received the following information:

- Three copies of the South and North System maps and water flow schematics
- Copy of operator logbook entries dated April 2017 – June 2017
- 2017 Flushing Logs
- Drinking Water Sampling Plan
- Distribution System Operations Plan
- Drinking Water Treatment Operations Plan
- Master permits for both Systems
- Sampling and Analysis Plan
- Reservoir Cleaning Log
- Fire Hydrants, Cross Connection, and Backflow Preventers Preventative Maintenance Contract
- Correspondence related to DDW's 2015 sanitary survey of the North System.

The following documents were provided after the inspection via email.

- Copies of the operator position descriptions
- Copies of public notices from 2016
- Northern System Data Sheets

SECTION VIII – LIST OF APPENDICES

Appendix 1 – South System Photograph Log

Appendix 2 – North System Photograph Log

Appendix 3 – Notices of Inspection

Appendix 4 – Attendance Logs

Appendix 5 – DDW's South System Sanitary Survey Dated June 9, 2017