

MINUTES

DEPARTMENT OF WATER SUPPLY COUNTY OF HAWAII WATER BOARD MEETING

September 25, 2018

Department of Hawaiian Home Lands, Kuhio Hale, 64-756 Māmalahoa Highway,
and Waimea Water Treatment Plant Site Visit, Kamuela, HI

MEMBERS PRESENT: Mr. Craig Takamine, Chairperson
Mr. William Boswell, Jr., Vice-Chairperson
Mr. David De Luz, Jr.
Mr. Nestorio Domingo
Mr. Leningrad Elarionoff
Mr. Eric Scicchitano
Mr. Kenneth Sugai (10:15 a.m.)
Mr. Keith K. Okamoto, Manager-Chief Engineer, Department of Water
Supply (ex-officio member)

ABSENT: Ms. Kanoe Wilson, Water Board Member
Mr. Bryant Balog, Water Board Member
Director, Planning Department (ex-officio member)
Director, Department of Public Works (ex-officio member)

OTHERS PRESENT: Mr. Craig Masuda, Deputy Corporation Counsel
Ms. Diana Mellon-Lacey, Deputy Corporation Counsel
Ms. Cynthia Moreira, Derrick's Well Drilling & Pump Services, LLC
Mr. Fred Camero, Beylik Drilling & Pump Service, Inc.
Mr. Ken Melrose
Mr. Ken Kawahara, Akinaka & Associates
Mr. Jeff Zimpfer, National Park Service
Ms. Karen Gast, SSFM International (12:08 p.m.)

DEPARTMENT OF

WATER SUPPLY STAFF: Mr. Kawika Uyehara, Deputy
Ms. Nyssa Kushi, Information and Education Specialist
Mr. Warren Ching, Energy Management Analyst
Mr. Kurt Inaba, Engineering Division Head
Mr. Richard Sumada, Waterworks Controller
Mr. Eric Takamoto, Operations Division
Mr. Clyde Young, Operations Division
Ms. Lisa Pennington, Waimea Treatment Plant Operator II (12:08 p.m.)

- 1) CALL TO ORDER – Chairperson Takamine called the meeting to order at 10:00 a.m. at the Department of Hawaiian Home Lands Kuhio Hale.

2) STATEMENTS FROM THE PUBLIC:

Ms. Cynthia Moreira

Chairperson Takamine: We have one Statement from the Public. Cynthia, if you could come up and state your name and organization?

C. Moreira: Cynthia Moreira, and I am Office Manager at Derrick's Well Drilling and Pump Services. I'm here to request to be added to next month's Agenda for relief of liquidated damages for the Waimea Deepwell material bid and also for Pi'ihonua No. 1(C) for pipe differential cost, I guess, because of the tariffs. It was...our job was before the Department of Water allowed the cost difference.

Chairperson Takamine: Okay. So I'll talk to the Department and then we will...

Manager-Chief Engineer: Yeah, we'll work out the details and agendize accordingly.

Chairperson Takamine: Sounds good. Thank you for coming today.

C. Moreira: Thank you.

3) APPROVAL OF MINUTES:

ACTION: Mr. Boswell moved for approval of the Minutes of the August 28, 2018, Water Board Meeting; seconded by Mr. Scicchitano and carried unanimously by voice vote.

4) APPROVAL OF ADDENDUM AND/OR SUPPLEMENTAL AGENDA:

ACTION: Mr. Boswell moved to add the supplemental report to the agenda; seconded by Mr. Scicchitano and carried by roll call vote: 6 Ayes: Messrs. Boswell, Scicchitano, De Luz, Domingo, Elarionoff, and Chairperson Takamine; 3 Absent: Ms. Wilson and Messrs. Balog and Sugai.

5) PUNA:

A. **JOB NO. 2018-1083, 'ŌLA'A #3 DEEPWELL REPAIR:**

This project consists of furnishing all labor, materials, tools and equipment necessary to remove the existing pump, motor, and column assembly; install a submersible pump and motor, column assembly, sounding tubes, and all appurtenant materials; chlorinate the well and pumping assembly; electrical work; and complete an efficiency test; in accordance with the specifications.

Bids for this project were opened on September 13, 2018, at 2:00 p.m., and the following are the bid results:

Bidder	Bid Amount
Derrick's Well Drilling & Pump Services, LLC	\$462,600.00
Beylik Drilling & Pump Service, Inc.	\$494,500.00

Project Costs:

1) Low Bidder (Derrick's Well Drilling & Pump Services, LLC)	\$462,600.00
2) Contingencies (9.9%)	\$ 46,200.00
Total Cost:	<u>\$508,800.00</u>

Funding for this project will be from DWS' CIP Budget under Deepwell Pump Replacement. The contractor will have 300 calendar days to complete this project. The Engineering estimate for this project was \$540,000.00.

Well History:

Original Installation:	March 1991
Repaired:	September 1993
Repaired:	January 2006

The Manager-Chief Engineer recommended that the Board award the contract for JOB NO. 2018-1083, 'ŌLA'A #3 DEEPWELL REPAIR, to the lowest responsible bidder, Derrick's Well Drilling & Pump Services, LLC, for their bid amount of \$462,600.00, plus \$46,200.00 for contingencies, for a total contract amount of \$508,800.00. It is further recommended that either the Chairperson or the Vice-Chairperson be authorized to sign the contract, subject to review as to form and legality by Corporation Counsel.

MOTION: Mr. De Luz moved for approval of the recommendation; seconded by Mr. Boswell.

The Manager-Chief Engineer commended staff for initiating this repair bid in advance of actual failure because it was beyond the duty cycle. Mr. Young and his fellow Mechanical Engineers worked to get this out ahead of time. The last repair was done in 2006, so it is time for replacement. For detailed questions, Mr. Young and Mr. Takamoto are available.

Mr. De Luz asked if the studies done on the North Kona wells have expedited looking at the other wells around the island to evaluate if repairs and maintenance should be stepped up, like auditing the wells.

Mr. Young replied that was correct. For this particular well, it is still running, but the GPM's are dropping off. There are only two wells in this 'Ōla'a system, and the Department wants to ensure there is a good well running in case there should be a problem with the second well and to stay ahead of the game.

Mr. De Luz commented that it is great that the Department is initiating a lot of the consultant's recommendations and being more proactive.

Mr. Boswell asked if the gyroscopic alignment is being checked on.

Mr. Young replied it is.

The Manager-Chief Engineer added that this well differs because although it is a submersible unit, it is only at about 600 feet elevation, so it is a lot shallower than the Kona wells. However, the Department will continue to do the prudent thing and get as much good information as possible moving forward. One of the thoughts is that because it is shallow and if the gyroscopic alignment evaluation turns out good, a line shaft might be another consideration here, so, again, implementing things that have been learned.

Mr. Elarionoff asked how many feet down the pump would be, in this 600-foot elevation well.

Mr. Young replied that elevation-wise, the head is 625 feet, so it is just below that.

Mr. Elarionoff asked if that meant it is below sea level.

Mr. Inaba stated that the head is still above sea level, but that is with the energy to take it through the column pipe.

Mr. Young noted that it is not like Kona where there is higher elevation/perched water. This one is basal, near sea level.

The Manager-Chief Engineer stated that “head” can be referenced to a couple of things--the actual lift of water versus total dynamic head. Total dynamic head includes friction losses as it pumps through the pipe and into the overflow of the reservoir. Although you might only be pumping at 600-foot elevation, lifting the water that high, your total dynamic head is going to be a little bit higher to account for the friction losses, etc.

ACTION: Motion was carried unanimously by voice vote.

6) SOUTH HILO:

A. **JOB NO. 2012-983 KA'IE'IE MAUKA FACILITY IMPROVEMENTS:**

This project generally consists of improvements to the existing facility that includes demolition work, pump/control building, booster pump station, chlorination system upgrades, chemical injection system and pumps, well discharge improvements, access roadway, associated water lines, civil site work, SCADA improvements, and chain link fencing, mechanical, electrical and structural work, in accordance with the plans and specifications, ready for operation.

Bids for this project were opened on September 20, 2018, at 2:00 p.m., and the following are the bid results:

Bidder	Bid Amount	Adjusted Bid Amt. w/Preferences*
Isemoto Contracting Co., Ltd.	\$2,004,849.70	\$1,904,607.22
Jas. W. Glover, Ltd.	\$2,065,558.00	\$2,045,281.00

*Bids were adjusted (for purposes of award) to provide credits for use of Hawai'i Products and participation in the State Apprenticeship Program, in accordance with Hawai'i Administrative Rules.

Project Costs:

1) Low Bidder (Isemoto Contracting Co., Ltd.)	\$2,004,849.70
2) Construction Contingency (~10%)	<u>195,150.30</u>
Total Cost:	<u>\$2,200,000.00</u>

Funding for this project will be from a DWSRF Loan. The contractor will have 365 calendar days to complete this project. The engineering estimate is \$1,630,575.00.

The Manager-Chief Engineer recommended that the Board award the contract for JOB NO. 2012-983 CONSTRUCTION OF THE KA'IE'IE MAUKA FACILITY IMPROVEMENTS, to the lowest responsible bidder, Isemoto Contracting Co., Ltd., for their bid amount of \$2,004,849.70, plus \$195,150.30 for construction contingency, for a total contract amount of \$2,200,000.00. It is further recommended that either the Chairperson or the Vice-Chairperson be authorized to sign the contract, subject to review as to form and legality of the contract by Corporation Counsel.

MOTION: Mr. Boswell moved for approval of the recommendation; seconded by Mr. De Luz.

The Manager-Chief Engineer noted that this project is to address a dated facility that needed improvements. It includes a booster station, control building work, pertinent piping, and some electrical work. Mr. Inaba was available for any detailed questions.

Mr. Inaba added that the bids were slightly higher than the engineering estimate (a little over 20%); however, two bids were very close and staff felt they were reasonable bids. The improvements need to be done on this project.

In response to Chairperson Takamine's question of where the project is located, he replied it is just past Pāpa'ikou School going towards Honoka'a. It is a couple of miles up on Ka'ie'ie Homestead Road. It is a very old plantation system. There was a small booster pump station offsite, and that will be relocated to the existing well site.

In response to Mr. De Luz's question of whether it is above or below the cemetery, he replied it is above.

ACTION: Motion was carried unanimously by voice vote.

7) SOUTH KOHALA:

A. **JOB NO. 2018-1089, LĀLĀMILO D DEEPWELL REPAIR:**

This project consists of furnishing all labor, services, materials, tools and equipment necessary for borehole alignment survey; to install a submersible pump and motor, column assembly, sounding tubes, and all appurtenant materials; electrical work; chlorinate the well and pumping assembly; and complete an efficiency test; in accordance with the specifications.

Bids for this project were opened on September 13, 2018, at 1:30 p.m., and the following are the bid results:

Bidder	Bid Amount
Beylik Drilling & Pump Service, Inc.	\$259,000.00
Derrick's Well Drilling & Pump Services, LLC	\$297,897.55

Project Costs:

1) Low Bidder (Beylik Drilling & Pump Service, Inc.)	\$ 259,000.00
2) Contingencies (10.0%)	\$ 25,900.00
Total Cost:	<u>\$ 284,900.00</u>

Funding for this project will be from DWS' CIP Budget under Deepwell Pump Replacement. The contractor will have 210 calendar days to complete this project. The Engineering estimate for this project was \$182,000.00.

Well History:

Original Installation:	April 1990
Repaired:	November 1996
Repaired:	April 1998
Repaired:	August 2004
Repaired:	February 2016

The Manager-Chief Engineer recommended that the Board award the contract for JOB NO. 2018-1089, LĀLĀMILO D DEEPWELL REPAIR, to the lowest responsible bidder, Beylik Drilling & Pump Service, Inc., for their bid amount of \$259,000.00, plus \$25,900.00 for contingencies, for a total contract amount of \$284,900.00. It is further recommended that either the Chairperson or the Vice-Chairperson be authorized to sign the contract, subject to review as to form and legality by Corporation Counsel.

MOTION: Mr. Boswell moved for approval of the recommendation; seconded by Mr. Scicchitano.

The Manager-Chief Engineer noted that a correction needed to be made for the Engineering estimate. Instead of \$182,000.00, the estimate should actually be \$307,000.00. The 182,000.00 was a preliminary estimate that failed to include the pump and motor unit.

ACTION: Motion was carried unanimously by voice vote.

B. KAMAKOA WATER AGREEMENT - LALAMILO WELL A UPSIZING – REQUEST FOR EXTENSION:

The developer, Kamakoa Partners, LLC (Kamakoa), has submitted a proposed AMENDMENT OF WATER AGREEMENT which would amend Section 1.1 of Article 1 and revise the term “Completion Deadline” to state: “Completion Deadline” shall mean the date ten (10) years following the Effective Date of this Agreement, or such other date as Kamakoa and the Water Board, acting through DWS, may mutually agree in writing from time to time. Kamakoa has stated that this request is due to their current anticipated permitting and construction schedule. The current agreement executed May 26, 2015, has a “Completion Deadline” of five (5) years from the Effective Date, or May 26, 2020. This amendment, if approved, would extend the deadline another five (5) years or until May 26, 2025.

The Manager-Chief Engineer recommended that the Water Board approve the AMENDMENT OF WATER AGREEMENT and if approved, the new “Completion Deadline” will be May 26, 2025, subject to the approval of the Corporation Counsel and that either the Chairperson or the Vice Chairperson be authorized to sign the documents.

MOTION: Mr. Boswell moved for approval of the recommendation; seconded by Mr. De Luz.

The Manager-Chief Engineer commended the developer and his representative because they have been in regular communication with the Department’s staff; and the Department likes to have advanced warning that the development may potentially take longer than previously expected, which allows it to come to the Board well in advance of the deadline. They have already done a lot of due diligence and preparation as far as the requirements to upgrade the facility. The Department is in agreement that this extension is valid.

Chairperson Takamine echoed the Manager-Chief Engineer’s comments. He appreciated the developer and his representative for being proactive on this one. It is a good project, and Mr. Kawahara is a very well-respected consultant and is familiar with working with the Department.

ACTION: Motion was carried unanimously by voice vote.

8) MISCELLANEOUS:

A. DEDICATIONS:

The Department received the following documents for action by the Water Board. The water systems have been constructed in accordance with the Department's standards and are in acceptable condition for dedication.

1. **BILL OF SALE**

Seller: CK Hale Condo (Katherine Karras)
Tax Map Keys: (3) 7-5-004:024
Facilities Charge: \$38,500.00, Date Paid: 9/17/2018
Final Inspection Date: To be announced
Water System Cost: To be announced

2. **GRANT OF EASEMENT AND BILL OF SALE**

Subdivision No. 12-001165
Grantor: Liliuokalani Trust
Tax Map Keys: (3) 7-4-020:032
Facilities Charge: \$17,875.00, Date Paid: 10/20/2016
Final Inspection Date: 3/20/2018
Water System Cost: \$180,534.00

The Manager-Chief Engineer recommended that the Water Board accept these documents subject to the approval of the Corporation Counsel and that either the Chairperson or the Vice-Chairperson be authorized to sign the documents.

MOTION: Mr. Boswell moved for approval of the recommendation; seconded by Mr. De Luz.

Mr. Inaba noted that for Item No. 1, the Final Inspection Date was September 24, 2018, and the Water System Cost is \$230,304.30.

ACTION: Motion was carried unanimously by voice vote.

B. MONTHLY PROGRESS REPORT:

Mr. Inaba highlighted two projects currently out to bid--the Wai'aha Water System Improvements - Transmission and the Waikoloa Reservoir No. 1 Earthquake Repairs, which the Board may have opportunity to visit today as part of the treatment plant process.

Chairperson Takamine asked what kind of damage was sustained at the Pi'ihonua-Kukuau Reservoir from Tropical Storm Lane.

Mr. Inaba noted there was extensive damage to the stream. A lot of debris came down, took out vegetation, and eroded the Department's easement. The Department has been working

with the contractor within the confines of the contract to make sure that the facility is protected. The stream area clean-up has just been completed and will be evaluated further. The impacts were far more than just this project itself.

Chairperson Takamine asked if the storm undermined the asphalt.

Mr. Inaba replied that it did. The entire road dropped because the base course under it was washed out. It was very unusual to see that happen. A lot of vegetation, trees, and large boulders also came down.

The Manager-Chief Engineer noted that there was no impact to the new tank and the pipeline around the tank. It was just to the cross-country pipeline between Kaumana Drive and the top of Sunrise Ridge (Kukuau Street). The line travels within an easement that the contractor recently paved over, and the stream was in that area.

Chairperson Takamine asked if the new pipeline was under the asphalt or if it was over.

Mr. Inaba replied it was under. The old pipeline is above but that did not get impacted. There was one in the steam that was buried due to erosion. That was a small 6-inch pipe, but it was repaired.

Mr. De Luz asked Corporation Counsel if there is a way within the context of Civil Defense where public safety prevails with regards to repair projects, in times like this where some facilities are impacted, especially when it comes to Acts of God.

Mr. Masuda replied there is, but it depends. During Hurricane Lane, there was a Declaration of Emergency issued by the Mayor. Sometimes the Governor also ads one, and sometimes he does not. It is fortunate that in this case, he did. What happens as far as recovery and repair is a waiver of some of the regulatory things you would have to go through in order to initiate any type of government construction, such as preparing an Environmental Assessment. In the last two emergencies, the Governor waived Section 103D from Hawai'i Revised Statutes, which is the Procurement Code; however, the departments also have to remember that in order to get reimbursement from FEMA, you must follow some type of procurement process, not necessarily the Procurement Code, but you have to have some type of process.

(Chairperson Takamine noted for the record that Mr. Kenneth Sugai joined the meeting at 10:15 a.m.)

C. **REVIEW OF MONTHLY FINANCIAL STATEMENTS:**

No questions.

D. **MANAGER-CHIEF ENGINEER'S REPORT:**

The Manager-Chief Engineer provided an update on the following:

1. North Kona Wells - The Manager-Chief Engineer asked the Deputy to provide an update on the wells. The Deputy reported that of the fourteen sources in the North Kona Water System, ten are still operational. The ten percent water conservation is still in effect for the district. The four wells that are offline are Honokōhau, Hualālai, Wai‘aha, and Palani. The expected timeframes for coming back online are Honokōhau first because the pump, motor, and seal section are on site. The contractor is working on the shroud to go around the motor, which is anticipated to be delivered by the week of October 8 and subsequent installation thereafter. Completion is looking to be mid-October. Hualālai Well is the next one. On the topside, electrical work was done, and a gyroscopic alignment test was done on the well. The motor and seal are completed, and the contractor is waiting for the pump to arrive. It is anticipated to be completed the end of October. The other two are Palani and Wai‘aha wells. At this point, it looks like the timing of when they will be back online is not as clear. Brown and Caldwell is looking at the bid specifications for Palani Well and will give their comments on it before advertising. They anticipate breaking Wai‘aha Well into two phases. The first phase would be to do another gyroscopic alignment test of the hole to check alignment again, and also do another pump test, a standard Commission on Water Resource Management pump test, to at least confirm what kind of capacity can be expected from the well. Once the due diligence phase is completed, the next phase will be to advertise the appropriate bid specifications with the appropriate size pump, motor, etc.

Mr. Boswell asked if that meant the pump and motor for both those wells have not been purchased yet and what timeline is being looked at.

The Manager-Chief Engineer replied that they have not been ordered and the timeline would be six to nine months for both wells. As Mr. Uyehara was mentioning, the Department wants to do more due diligence on Wai‘aha Well because there is a pump and motor down in the hole. Because of the risk of damaging the casing if an attempt is made to pull it out, the consensus is to leave it down there but do a gyroscopic evaluation to see how straight the hole is and do a long-term test to see what the yield is with the obstruction down there. That information will be needed before preparing specifications to drop a new pump and motor down. Those results will determine if only a 700-gpm unit can be designed for, or if a 1,000-gpm unit can be used, based on what was learned from Brown and Caldwell’s study. It all really depends on the first phase, the due diligence part.

Mr. Boswell noted that in both cases, it is looking like the third or fourth quarter of 2019 for completion.

The Manager-Chief Engineer replied that was correct. For now, the Department is focusing on Honokōhau and Hualālai wells and also some new well sites that the Engineering Division is working on.

Mr. Elarionoff asked what the worse-case scenario from the gyroscopic test would be.

The Manager-Chief Engineer replied that if there is a real kink in the casing that the Department was not aware of prior to this, it may indicate that if another submersible unit were dropped down, the motor might be in contact with a portion of the casing, which would cause stress on the connections of the motor and the pump. The Department does not anticipate something that bad, but it will not be revealed until after the gyroscopic alignment test is completed. In response to Mr. Elarionoff's question of what the remedy would be if it did turn out to be kinked, the Manager-Chief Engineer replied that it would come down to how far the drift or kink is and whether a slim line unit would still work, or if not too bad, go back and see what would be more readily available as far as units similar to other well locations. With regards to Mr. Elarionoff's question of whether a slim line would cut production, he replied that it would not necessarily cut production but just that different factors would be involved. There would be a need for a shroud since slim lines, confirmed by Mr. Takamoto, are what they call two-pole, meaning twice the RPM's. However, the Department will keep the Board apprised of the progress on these wells and provide reports.

2. Department of Water Supply Energy Report - Mr. Ching asked if the Board had any questions or anything they wanted to see on the next quarterly report.

Mr. De Luz commented that battery technology is always improving and asked if the Department is looking into potentially doing a beta test site on alternative energy for any of the pump generators. He believed there was a North Kohala test site by the State Department of Business, Economic Development & Tourism, which was a combination of wind, battery, and photovoltaic (PV) storage. There may be more companies interested in that combination than just regular PV's. The problem with generators is maintaining them and getting fuel to the site during emergencies.

The Manager-Chief Engineer noted on the last page of the report that Mr. Ching has been tasked with doing a CIP project, a Request for Proposals, to implement a solar PV system at five office locations and battery is expected to be factored into those proposals.

Mr. De Luz asked about the Department's emergency preparedness and if it has a cooperative agreement with the other utilities for things such as fuel storage.

The Manager-Chief Engineer stated that there is what is called "HIWARN" which is a cooperative agreement among the drinking water utilities (Honolulu, Kauai, Maui, and Big Island) basically for services, material, supplies, and manpower. For things like fuel, that is coordinated through the County Civil Defense Agency because HELCO would typically be adversely affected by a hurricane. Another major component is communication and access.

Mr. Ching stated that from what he understood, battery technology is kind of lacking in the PV sector and overall in general. The technology is not developing as fast. He expects it to catch up in the coming years.

Mr. De Luz suggested to the Manager-Chief Engineer that if Mr. Ching ever has an opportunity to travel to Northern California, to let him know because Livermore Labs would be a great place for him to go visit, especially Dr. Bactagula who is one of the battery specialists. He had opportunity to meet him a couple years ago, and he is a very interesting gentleman. HELCO has worked with them on their integrated non-firm energy software to help fluctuate their load. Their problem is especially with wind more than PV, where it can spike very significant and quickly. It would be worth a one-day trip for Mr. Ching if he is ever in the area. He recalled a magic number coming from that person that a battery has to be able to pencil at 3 cents a kilowatt. That would be the magic number for it to be competitive with fossil fuel.

Mr. Ching also noted the challenge with battery costs right now.

Mr. De Luz stated that he believes flow batteries are the thing, but there are many issues with a flow battery. Europe is doing a lot with them and they are way ahead in that regard.

E. CHAIRPERSON'S REPORT:

1. Chairperson Takamine did not have anything new to report; however, as mentioned last month, the Board will be selecting a new Chairperson/Vice-Chairperson in November for the 2019 year; and he is looking at the new Chairperson being on board in December and have that new person run December's meeting. He also asked that the Department lobby for a replacement for his District II spot on the Water Board. He will be around to help if needed.

9) **ANNOUNCEMENTS:**

1. **Next Regular Meeting:**

The next meeting of the Water Board will be October 23, 2018, 10:00 a.m., at the Department of Water Supply, Hilo Operations Center Conference Room; 889 Leilani Street, Hilo, Hawai'i.

2. **Site visit today:**

Site visit to Waimea Water Treatment Plant, (65-1190 Spencer Road, Kamuela, HI) to view and discuss Waimea Water Treatment Plant Upgrades project. If anyone needs directions, let staff know. He called for a Recess and Reconvene at the Waimea Water Treatment Plant site for the remainder of the Agenda. The Manager-Chief Engineer noted that staff would need time to pack up from this meeting venue and then travel to the site.

RECESS: 10:37 a.m.

10) **RECONVENE: 11:18 a.m. Waimea Water Treatment Plant**

- A. Mr. Uyehara, Deputy, provided an overview of the Treatment Process and Microfiltration Membrane Upgrades.

He noted that this is the South Kohala Water System. It is the Department's only surface water system. Everything else is considered groundwater. The main sources are the Kohākōhau Stream and Waikoloa Stream. The stream runoff is collected into channels where is piped down into the reservoirs. The area where this site visit began is Reservoir No. 2, which is at the top. The middle one is Reservoir No. 1, and the one below it is Reservoir No. 3. Each reservoir is 50 million gallons. After the 2006 earthquake, there was some damage to this Reservoir No. 2, exhibited on the perimeter side and some cracking within the concrete panels. All three reservoirs have concrete panels on the inside slopes and at the bottom. The geosynthetic or geomembrane liner was added as part of the repair project after the earthquake.

Mr. Inaba added that in lieu of the effort to redo the concrete panels so they would be waterproof, the liner was added, which was a more cost-effective way to do the repair. It is called Hypalon and comes in rolls. There is a geotextile fabric beneath the liner to protect the Hypalon from the underside.

In response to Mr. Domingo's question of whether it covers the whole thing seamlessly, he replied it does.

The Deputy asked Mr. Inaba to touch upon the repair process involved for the concrete panels.

Mr. Inaba stated that a ground-penetrating radar was used to find cracks or voids behind the panels. The contractor drilled through those panels, one at the top and one at the bottom; and they pumped in the grout behind it until it came out the top. It was quite an effort just to scan all of the panels. Part of how the reservoir works is it receives water from a stream, but it is actually piped in so the only way water can get into it is from the 16-inch pipeline which he pointed out. He mentioned the concern because of what happened on Oahu during the last storm, which was overtopping. That is not really seen as a concern here because the water is only coming in through that pipe; and if the water level is getting high, it can be shut off at the valve. The only other way for water to get in is from rain, and there is a spillway and inlet pipe, which are concrete lined so it will not wash out the embankment if it goes over the spillway.

Mr. Boswell asked what happens to the stream water if the valve is turned off during heavy rain or where it would go if the Department is only taking a portion of that water.

Mr. Inaba replied that the Department is only taking a small portion of it. It is diverted automatically, in response to Mr. Boswell's next question.

The Manager-Chief Engineer asked Mr. Inaba to explain part of the other improvements that went into this reservoir repair that further enhances the safety. This is a regulated dam under

the Department of Land and Natural Resources' eyes, and the Department of Water Supply has to follow all of the requirements of their Dam Safety Division.

Mr. Inaba explained that it is not like a typical dam where you put it in a stream and collect water naturally. This is considered a reservoir to this Department; but under the regulations of the State, it is considered a dam. With the repair, the consultant looked at the embankment and beefed it up to the current design requirements. They also put in inspection ports along the toll, or the bottom of the embankment, to see if there is any seepage coming out.

Mr. Scicchitano asked how that is monitored.

Mr. Inaba replied that staff walks it but now has a vehicle which can be used to inspect. There is also a piezometer which measures within the embankment if the slope is getting saturated.

The Manager-Chief Engineer added that under the dam requirements, every time there is an event such as the earthquakes that happened in Volcano, if it was a 5.0 magnitude or greater, the Department had to inspect these dams every time. It involves inspecting the whole perimeter and reporting to the State. Also part of the requirements is that the grass cannot be too long around the perimeter. He suggested walking out to the other side of the reservoir to view the spillway to see how it is maintained and monitored.

Mr. Inaba stated that this raw water makes its way down to the treatment plant process which is the water that is eventually consumed.

Mr. De Luz asked what the lifespan of the geomembrane liner is.

Mr. Inaba replied that it has a 30-year warranty.

Mr. Boswell asked about earthquake events.

The Manager-Chief Engineer stated that the reinforcement of the slope was designed based on the seismic zone of the area.

Mr. Inaba added that the slope redesign took into account the event that occurred in 2006.

Mr. Boswell asked about the native soil and if anything was done, like treating it.

Mr. Inaba stated that when the inspection was done after the earthquake, the weather was clear and dry for some time. The specifications called for native soil replacement. During the construction progress, the area experienced the typical Waimea mist, also known as a microclimate. To get the proper moisture content on the native soil to place it, they could not meet the specifications. A change order was done and imported base course was brought in to ensure a more stable embankment. The Department agreed to purchase the material if the contractor would do the work at the same cost.

In response to Mr. Domingo's question if this is all fed by gravity, Mr. Inaba replied it is.

Mr. Masuda asked about another pipeline at the site, a white pipe.

Mr. Inaba stated that it is for when drought occurs. Water is piped from a flume or ditch further up into the stream. There is not that much water, but there is some water that comes down that way.

In response to Mr. De Luz's question of what the intake is on a daily basis, Mr. Inaba replied it is about two million gallons a day.

The Manager-Chief Engineer added that the consumption the Department provides in the community is roughly that two million gallons.

Mr. Sugai asked how large an area this water serves.

Mr. Inaba stated that it covers from Āhualoa, but used to go all the way to Pa'auilo through the mauka section, and can feed down into Honoka'a; but right now it goes to Āhualoa and comes this way to Waimea and goes down Kawaihae Road, but it stops above the Queen Ka'ahumanu Highway. The Puakō area is fed by the Lālāmilo and Parker wells, which is a separate system.

Mr. De Luz asked about the Kukuihaele Well, which is a new well.

Mr. Inaba stated that Kukuihaele Well is not quite on line, but there are two systems that can feed the area, so they are currently getting water from Waimea.

Mr. De Luz asked if Kukuihaele Well will back up Pa'auilo eventually.

Mr. Inaba replied it will not. This South Kohala Water System backs up Pa'auilo. Āhualoa Well water goes to Pa'auilo.

Mr. Domingo asked if there are any further concerns or repairs needed on this reservoir.

Mr. Inaba replied this reservoir is complete and no further improvements are required.

Mr. Elarionoff stated that this was interesting information, but up on the hill is much more interesting because the guys who worked on the flume hand carved the rocks, 24 inches square by 6 inches thick. They carved the rocks from a quarry and put it in place.

In response to Mr. Sugai's question of how far the flume is from this area, Mr. Inaba replied it is about four miles.

Mr. Elarionoff added that the leftover water that does not come to this reservoir goes to Lakeland and then down to Waipi'o.

Mr. Inaba stated that the Department does not usually take from there. Only when there is no water.

Mr. Sugai asked where the streams go down to, and if one was behind Ana Ranch.

Mr. Inaba replied that is the Kohākōhau Stream, and the Manager-Chief Engineer noted that Waikoloa Stream is the one that goes behind KTA and then down Kawaihae Road.

Mr. Elarionoff mentioned that when you live in this area, you see the water is not clear; and you see that orange color. That is the “mea” which is what Waimea is all about. “Wai” means water, and the “mea” means “there is something in the water,” the meaning of Waimea. Jokingly, he said the Department of Water Supply removes the mea from the water and ruins the Waimea name.

Mr. Domingo asked if there are any concerns in this area about replenishment or drought.

Mr. Inaba replied there are concerns about drought; however, there are two wells that supplement the system, the Waimea Well and the Parker Ranch Well. The treatment plant still needs to be run, so in cases where there is not enough water coming in, that is why the raw water storage is needed to last through the drought.

Mr. Elarionoff asked if Parker Well water comes from a separate aquifer.

Mr. Inaba replied it is drawn by line, from what he believed is the Waimanu Aquifer, just by the line designation; and it is right behind Church Row.

The Board walked over to the spillway area at the top of the reservoir.

Mr. Sugai asked if there is a big storm and a lot of flow going in and flow going out, if the spillway is like a collection area or if it goes back into the stream.

The Manager-Chief Engineer explained that the spillway differs from a lot of dams throughout the State where the concern is overflow causing erosion. He pointed out that the spillways here are concrete lines, not just earthen, giving extra protection.

In response to Mr. De Luz’s question of how the depth is in the reservoir, Mr. Inaba replied it is 30 feet. Overall, the height may be 35 to 36 feet.

Mr. Domingo asked how long this facility has been around.

The Manager-Chief Engineer indicated it has been since the 70’s, so almost 50 years.

Chairperson Takamine called a **Recess at 11:40 a.m.** to allow time for the group to get to the treatment plant building. The meeting reconvened at 12:00 p.m.

At the treatment plant, the Deputy handed out a diagram showing the flocculation process. The raw water from the reservoirs is gravity fed down through piping which comes in to the head of the plant. After it comes to the plant, it goes into the coagulation and flocculation basins. Inside the chemical building, coagulants are injected into the water. It bonds, based on the chemical properties, with any debris or organics in the water. He pointed out the color of the water, as Mr. Elarionoff mentioned earlier, the “mea.” The coagulants bond with the organics, and the paddles seen in the basin help it coagulate together and flocculate down to the bottom.

The Deputy had the group walk down past the basins, showing the flow of the water from mauka down to the treatment plant. The next basin over is the sedimentation basin. It is part of the pre-treatment process. To the far end is a trough which skims the water off the top of the basins. From that trough, water goes down into the new part of the plant.

In response to Mr. De Luz’s question of how the sedimentation basin is cleaned, the Deputy replied that it needs to be taken off line occasionally in order to power wash it.

Mr. Domingo noted that the water was clearer in the sedimentation basin and asked if it was ready for consumers at this point.

The Deputy stated this was still considered raw, untreated water.

Mr. Domingo asked if it was a constant flow in and out. The Deputy replied yes.

In response to Mr. De Luz’s question of whether the water is pre-chlorinated when it goes into the system, the Deputy replied it is.

The group gathered at the front of the new treatment plant building where the Deputy introduced Ms. Karen Gast of SSFM International, who is the construction manager for the new treatment plant project. She was on site during much of the project. He asked her to join the site visit today in case there are technical questions. He also pointed out an area between the new building and the old building where the automatic filters are located, which pick up the larger particles that might still be left in the water. The group then entered the lower level of the plant.

The Deputy showed where the water was getting pulled in from four booster suction pumps. Behind the wall is where the actual membrane filtration basins are located. It is a submerged membrane. On the second page of the handout, it shows the cartridge assembly. Upstairs in the plant is where the membrane basins can be seen, each basin containing the cartridge assemblies. In each tube is the microfiltration membrane, or filament. That is the product or material where basically the pore sizes are so small that you suck water from the outside in. The membranes are dropped into the raw water to clarify it, after which the suction pumps pull all of the clean water through the membranes and take it up through the process piping. Whatever microorganisms or turbidity is still left goes to the backwash, where it finishes with processed, potable water.

Ms. Gast stated there are four separate basins. They generally run three at one time and one on standby. That allows equal use of the membranes over a period of time and allows for cleaning of the membranes so they last longer. Each basin has its own set of membrane cartridges and its own backwash supply. Everything is labeled so you can tell which way water is going. As the finished water comes through, it goes all the way across and then up to the second floor. She pointed out an air valve where the first set of chlorine is injected. That travels around the building and has a contact time of about 20 minutes. There is a reading on the system on the finished water after ammonia is added to help balance the water before going into the Clear Well. All of that information, from the turbidity on the side wall, to the injection points, is gathered into the computer room in the company's TPC (Telemetry and Process Control) to get reported to the Department of Health. There is no more handwriting or trying to put that into a paper form. It is all generated automatically and is all read. There still is the old reader at the end before the water goes out so it is getting constant readings as it goes through. There is no more manually watching it. The other good thing about this system is that it tells if there are any failures so they can be adjusted right away. In addition to that, the system can be controlled remotely. The Department's Lead Water Treatment Plant Operator IV, Mr. Anthony Tanodra, can remotely restart the system from a laptop instead of coming to the plant, sometimes in the middle of the night, if it is a quick fix. She then pointed out the cleaning system. On the outside of the building is a neutralization tank and a hot water tank. The hot water is for the cleans and they are done once a month. The neutralization tank is used to neutralize the system water as the cleans are being done to ensure that the water being put into the sludge lagoon is neutralized and not too acidic or alkaline. She showed where the readouts are which read the different components and then inject as necessary to make sure the water is in balance. This has all been very helpful for the staff. They are getting a lot of hands on and learning the system; and the plant has been producing two million gallons of water a day with little to no problem.

She then led the group into the control room and noted that one of the things that had to be modified is that the use of solid concrete for the control room made it impossible to get a cell phone signal, so they are going to bring in a hard-wired antenna.

Ms. Lisa Pennington of the Department's staff was introduced to the group. Ms. Gast stated that the computer system in this room is the brains; and is where the system can be monitored, whether it be the controlling system of the data which is coming in which is the TPC system, which takes the information from the Evoqua system. The Operator can see what the Evoqua system is doing. There is also a monitor on the second floor. The Operator can see what that Evoqua system is doing and then correlate it straight into the TPC system and see if it is also reporting. The TPC system reports a little bit more information, sometimes too much, so it was dialed it back to reporting every three minutes rather than every three seconds.

The Deputy noted that the consultant helped staff work through some tweaks with the contractor still on board to make it easier for the operators to manage.

Moving on to the second floor, Ms. Gast showed where the water comes in, gets pushed through the membranes, and then goes out. To clean the membranes, the water is pushed back through with air. The basins are each covered by a grate and then a solid cover over that because of Department of Health regulations. This is a secured facility. The only people in there are the Operators.

The Deputy mentioned that the Contractor, Bodell Construction, signed up for a two-year service and maintenance agreement with the Evoqua company. The next visit by them will be the end of October or early November. He noted that the crane on site is to extract the cartridges from the basins for inspection. As Ms. Gast had said earlier, the water is pumped outside and around this building where it is injected with chlorine and sits for a bit longer. It then gets corrosion control chemicals added and finally goes into the 2-million gallon Clear Well. From there, it is fed down to Āhualoa and down Kawaihae Road. He noted that this project has multiple benefits. The membranes, in the industry's eyes and Health Departments around the country, are recognized as a positive barrier to microorganisms. Prior to this, sand filtration was used. The benefit is that the sand filter plant required a Grade IV Operator in the Department of Health's eyes; and there are not very many Grade IV's in the State. This Department is fortunate to have one Grade IV Operator, Mr. Anthony Tanodra, who is a very dedicated employee. This new filtration method requires a Grade II Operator, and there is more availability for Grade II, one of them being Ms. Pennington who the Board had just met in the control room.

Ms. Gast added that the contractor worked with staff and helped add visuals on the equipment to make it easy for a new operator coming in to train on the equipment.

The Board thanked Ms. Gast for her presentation today.

11) ADJOURNMENT

Chairperson Takamine thanked the Department for allowing the Board to do this site visit. It was very informational and great that the majority of the Board could come and see what the CIP monies went to. He then called for a Motion to adjourn the meeting.

ACTION: Mr. Boswell so moved; seconded by Mr. Sugai and carried unanimously by voice vote.

(Meeting adjourned at 12:30 p.m.)

Recording Secretary