

EACP Committee

From: Shay Chan Hodges <shay.chanhodges@gmail.com>
Sent: Sunday, October 13, 2019 12:04 PM
To: EACP Committee
Cc: Gina M. Flammer
Subject: Letter to Council Member Sinenci from BWS TIG
Attachments: TIG Letter to EACP-10.13.19.pdf; Temporary Investigative Group- Research.pdf

Aloha:

Please find attached a letter from the BWS TIG, to be submitted to EACP Chair Shane Sinenci for Tuesday's October 15 Meeting, Agenda item: PROTECTION AND PRESERVATION OF EAST MAUI STREAMS (EACP-22)

Mahalo.

Shay Chan Hodges
808.250.6160



October 13, 2019

Council Member Shane Sinenci
Chair, Environmental, Agricultural & Cultural Preservation (EACP) Committee
Maui County

Aloha Committee Chair Sinenci:

As you may know, the Board of Water Supply (BWS) Temporary Investigative Group (TIG) will be presenting its report on the **Feasibility of Purchasing and Maintaining the EMI Water Delivery System** on Thursday, October 17, 2019 to the Board of Water Supply. The report will be posted publicly sometime in the next few days.

Last week, on October 4, 2019, the BWS TIG provided notes from our research to your Environmental, Agricultural & Cultural Preservation (EACP) Committee in preparation for the 10/7/19 EACP Committee meeting.

As stated in TIG Vice Chair Shay Chan Hodges' email of 10/4/19, the notes were not to be construed as representing conclusions or recommendations of the TIG report. They were provided in the public interest for discussion purposes. (Those notes are attached again to this email.)

The research provided last week included:

- **TIG Investigation Background**
- **How the EMI System Impacts East Maui & Upcountry Maui**
- **Strategies for Creating and Conserving Fresh Water Capacity**
- **Native Hawaiian Land & Water Rights**
- **Considerations re: Purchasing & Maintaining the EMI System**
- **Condemnation Requirements**
- **Alternative Water Sources**

Some of the above was discussed by TIG Chair Norman Franco and TIG members Toni Eaton and Shay Chan Hodges at the 10/7/19 EACP Committee, at which Mr. Franco and Ms. Chan Hodges were asked to be a resource. TIG members also verbally presented additional information that had been compiled after 10/4, but before 10/7/19, which is provided here with reference information in order to facilitate additional research by the EACP Committee.

1. Excerpts from Department of Water Supply Fiscal Year 2018 Annual Report:¹

- Piiholo Water Treatment Plant: Water produced during FY18: 1,197,415,000 gallons.
- Daily average: 3.28 MGD
- Kamole Water Treatment Plant: Water produced during FY18: 449,530,000 gallons. Daily average: 1.50 MGD
- Olinda Water Treatment Plant: Water produced during FY18: 484,370,000 gallons. Daily average: 1.33 million gallons per day (MGD).

2. Excerpts from: Wai o ke Ola He Wahi Mo'olelo no Maui Hikina, A Collection of Native Traditions and Historical Accounts of the Lands of Hāmākua Poko, Hāmākua Loa and Ko`olau, Maui Hikina (East Maui), Island of Maui, Kumu Pono Associates²

Those portions of the new and old Hamakua Ditch, located upon Government land, reverted to the Government with the expiration of the Hamakua (1916) and Keanae (1925) Licenses respectively; and accordingly have been the property of the Government for some time.

The Wailoa Ditch, which is located on the Spreckels Hamakua License, is still the property of East Maui Irrigation Co., but those parts which are on Government land will revert to the Government at the expiration of the Spreckels Hamakua License in 1938...

3. Per the Office of Hawaiian Affairs, Kipuka database, of the 30,000 acres of land on the Tax Map Key numbers listed in the Draft EIS, 18,000 are crown lands.³

TMK	Acres
2/1-2-004-005	1576.07
2/1-1-004-007	3821
2/1-1-002-002	13007.1
2/1-1-001-044	3371.97
2/1-1-001-005	2121.85
<u>2/2-9-014-001, 005, 011, 012, 017</u>	<u>6630.84</u>
Total acres	30,528.83

¹ <https://www.mauicounty.gov/DocumentCenter/View/115629/DWS-FY18-Annual-Report>

² <http://www.ulukau.org/elib/collect/maly6/index/assoc/D0.dir/book.pdf>

³ <http://kipukadatabase.com>

4. Acquisition Costs

TIG members presented information about what Mahi Pono paid for the EMI Aqueduct system and estimates for short-term improvements.

Estimated Expenses	Amount	Notes
Purchase Price, which includes any land parcels or easements	\$5,442,333.48 (possibly less any depreciation since 12/17/18 purchase due to neglect.)	Based on MP purchase price for full system, including any land parcels or easements (note only half has been paid.)
Estimated costs for needed short-term Improvements (over the first two years)	\$6 million per year, \$12 million over two years.	Based on 3% of Replacement Asset Value (RAV) of \$200 million (EMI DEIS estimate of full system replacement cost)
Total Purchase Price plus substantial improvements:	\$17.4 million	Improvements from the beginning

Bond Payments:

A 30-year municipal bond financing for \$17.4 million at 3.75% would require debt service payments totaling \$966,985 annually.

Value of Purchasing System Prior to Mahi Pono Obtaining a Long-Term Lease:

If Mahi Pono is able to obtain a 30 year lease, the company will likely try to argue that the EMI aqueduct system has a higher value with a long-term lease than the original price of \$5.4 million. There are clear indications from the December 17, 2018 purchase agreement with Alexander & Baldwin that a core component of Mahi Pono’s investment strategy is the monetization of public trust water resources as evidenced by A&B’s obligation to rebate Mahi Pono \$62 million of the purchase price if Mahi Pono does not obtain a water lease allocation of at least 30mgd.

5. Value of the System Based on Water Delivery Rights:

Maui County Department of Water Supply potable water rates for agricultural users: \$1.10 per 1,000 gallons for use over 15,000 gallons per month. Maui agricultural users who use less than 15,000 per month pay residential rates (\$2.05 to \$3.90 per 1,000 gallons.)

According to the Draft EIS, Page 2-18:

The Mahi Pono farm plan assumes the following: The total surface water available for use after system losses is estimated to be approximately 65.88 mgd.

Convert 65.88 mgd to kgal (1,000 gallons)	Convert to kgal per year (365 days)	If water were delivered at current agricultural rates (\$1.10 per 1,000 gallons)
65,880 kgal	24,046,200 kgal per year	\$26,450,820

6. Operations Cost Using EMI's Estimates as a Baseline

According to the Draft EIS, EMI estimates Mahi Pono's operations costs at \$2.5 million. The estimates below for a public entity that is charged with safeguarding the public trust add an additional \$3 million per year for repair and maintenance and \$6 million for watershed restoration.

Estimated Expenses	Amount	Notes
Annual Operating Costs	\$2.5 million	Based on figure cited in EIS, includes labor, fringe benefits, materials, professional services, taxes, maintenance, anticipated rental payments to the State for the Water Lease, and other expenses
Annual Improvements and Maintenance	\$3 million	1.5% of Replacement Asset Value (RAV) of \$200 million (EMI DEIS estimate of full system replacement cost) annually
Annual Watershed Monitoring and Restoration	\$6 million	Adds to \$2.69 million in current funding from all sources. (Brings total to \$8.69 million annually.)
Debt Service on \$17.4 million municipal bond	\$1 million	Annual \$966,985 payment
Total Estimated Annual Expenses	\$12.5 million	

7. TIG members also addressed Senator Kai Kahele Letter, which was presented by EACP Chair at the 10/7/19 meeting states:

In light of these developments, I would highly recommend that the County of Maui and DWS immediately submit a water lease application to the DLNR. A copy of the

*Request for State Lands Application Form is attached for your convenience. Doing so now will provide the Board of Land and Natural Resources ample time to review and issue a revocable permit to the County of Maui and DWS by the end of this year so that Maui County secures its own, independent authority to continue to provide its residents with access to diverted surface water imported from state lands in East Maui via the EMI aqueduct system. Domestic water use is a protected “public trust purpose” and I am confident that as the necessary application requirements are satisfied, the County of Maui and DWS will secure a long-term water lease from the State of Hawai‘i.*⁴

As noted above, the TIG has continued to compile research for its report, which it intends to present at the Board of Water Supply meeting on 10/17/19, along with conclusions and recommendations.

Additional research that may be of interest to the EACP Committee meeting:

1. Recent Studies about the Impact of Conservation on Water Supplies:

University of Hawaii Economic Research Organization (UHERO) and Water Resources Center partnered with the Nature Conservancy of Hawaii to evaluate how native forest conservation contributes to local water supplies in a water stressed area in East Maui. They found that by preventing the degradation of native forest, conservation efforts could save the local water utility up to 137.6 million dollars over 100 years depending on a range of assumptions.

2. Research on Impacts of Agriculture on Environment:

Per the November 2018 Impact investing in the global food and agricultural investment space, *Investing profitably whilst fostering a sustainable and thriving agriculture*⁵:

It is now acknowledged that agriculture is a strong contributor to climate change, with a sector contribution of 19-29% of total global greenhouse gas emissions. According to the Food and Agriculture Organization (FAO), Agriculture, forestry and other land uses (AFLOU) have emitted a total of 10.6 gigatonnes of CO₂ equivalent in 2010. The main direct sources of GHG emissions in agriculture are not only carbon dioxide (CO₂), but also nitrous oxide (N₂O), mostly through the

⁴ Appendix 3

⁵ <https://www.valoral.com/wp-content/uploads/Valoral-Advisors-Impact-Investing-November-2018.pdf>

application of fertilizers, and methane (CH₄), essentially from livestock and rice cultivation. Deforestation and land degradation have also reduced the sector’s capacity to absorb or sequester carbon dioxide from the atmosphere.

While the Draft EIS acknowledges the negative impacts on climate of agriculture, there are no specific estimates of how Mahi Pono’s farm activities will affect Maui’s carbon footprint, only the statement that ranching activities will be “negligible.”

3. Potential Sources of Public and Environmental and Infrastructural investment funds:

A publicly-owned water delivery entity, whether the County or a “Maui Water Authority,” would have access to public funding for maintenance of the system and restoration of wetlands that a private owner can’t access. For example, grants and loans are available through the US Department of Agriculture, Rural Development agency for water and environmental programs. These grants are focused on populations of 10,000 or less so they could possibly apply to East Maui.⁶ The USDA’s Rural Utilities Service (RUS) provides much-needed infrastructure or infrastructure improvements to rural communities. These include water and waste treatment, electric power and telecommunications services. The US Bureau of Reclamation also provides funding for large scale water management, efficiency, and development.⁷

5. Example Governance Structures

The TIG has researched several potential governance structures.

Governance structure	Pros	Cons
Shareholder owned (Example, A&B)	<ul style="list-style-type: none"> • Significant access to capital and human resources 	<ul style="list-style-type: none"> • Objectives of shareholders are often not aligned with the public interest
Private Equity controlled (Example, Mahi Pono)	<ul style="list-style-type: none"> • Potential to facilitate growth and innovation • Access to various sources of capital 	<ul style="list-style-type: none"> • Relatively high cost of capital • Financial incentive structure which is misaligned with the long-term public interest • Potential financial distress

⁶ <https://www.rd.usda.gov/about-rd/agencies/rural-utilities-service>

⁷ <https://www.usbr.gov>

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		<p>with broad impact if acquisition is heavily leveraged.</p> <p>Absentee ownership and foreign governance</p>
Co-op	<ul style="list-style-type: none"> • May have access to Rural Development funding • Align stakeholder interests 	<ul style="list-style-type: none"> • Strength of leadership may vary based on outcome of board elections. • Local population might be unengaged or uninterested in water co-op management
Municipal Water Authority	<ul style="list-style-type: none"> • Low cost of capital • May benefit from access to tax exempt debt financing • Public accountability <p>Could lower rate water rates for local farmers and fund watershed restoration and management</p>	<ul style="list-style-type: none"> • Potential difficulties in recruiting employees with adequate technical skills needed to run water authority • May be subject to political interference.
Hybrid (private sustainable business corporation with majority government ownership)	<ul style="list-style-type: none"> • Public / private ownership could provide “best of both worlds.” • Government ownership can present “halo” effect for raising capital • Potential for both equity and debt • Exempt from civil service restrictions 	<ul style="list-style-type: none"> • Potential political interference. • Possible conflicting incentives between entities on the board. <p>Uncommon ownership structure may result in greater legal complexity and stakeholder confusion</p>
Independent Public Water Authority	<ul style="list-style-type: none"> • • With well designed and implemented governance structure, would allow for optimized delivery and system reliability, coordinated planning in sync with public interest. 	<ul style="list-style-type: none"> • Requires establishment of independent entity. • Possible need for charter amendment <p>Potential challenges in raising capital</p>

The TIG has researched some of the steps necessary for creating a public governance model, which will include, but not be limited to:

- 1) Outlining the legal requirements for creating a public utility with bond authority, which would be regulated by the Public Utilities Commission (PUC);
- 2) Determining what kind of charter change would be necessary and how that step fits into the overall timeline of purchasing the system and obtaining bidding rights;
- 3) Identifying potential private and public partners, if appropriate, including investors, public funders, and foundations;
- 4) Developing a plan for the governance infrastructure that embeds transparency, accountability, and commitment to environmental, cultural, and community values.

6. Additional Necessary Research and Studies:

The TIG has also compiled a list of necessary information for any entity that intends to serve the Public Trust through the purchase of the EMI Aqueduct System:

Evaluating Capital Expenses Of Acquisition And Modernization

- ✓ Engineering studies of the current condition of the EMI Delivery System;
- ✓ Reliable data regarding elevations and the amounts of water moving through the 388 intakes, ditches, dams, pipes, and flumes;
- ✓ Cost estimates for repair and maintenance as well as alternate modifications, such as installing pipes in open ditches and flumes and modern diversions that support connectivity for streamlife;
- ✓ Determining the amount of the EMI Aqueduct and possibly other water systems that are connected to the Kamole Weir, as well as watershed lands that would be optimal for the most efficient short- and long-term delivery of water to the public, with maximum sustainability of the aquifer;
- ✓ Creating a plan for the County to acquire existing land, easements, and infrastructure by eminent domain, using bond money.

Considerations of New Revenue and Expense Models

- ✓ Additional studies that build on current research regarding the measurable impact of watershed restoration on increased availability of water;
- ✓ Models and estimates regarding potential costs of installation of renewable energy systems to support treatment facilities, uphill transmission, and/or well pumping, along with energy savings;
- ✓ Models and estimates of hydro-pumped energy creation and storage utilizing water and wastewater;

- ✓ Determination of the water rate fee structure that allows a reasonable rate of return to the investors who put up the capital, which includes estimates of fees collected from the Department of Water Supply, Mahi Pono, A&B, residents, farms, and other commercial users, and which will be approved by the PUC;
- ✓ A risk management plan that addresses liabilities that a new owner will assume when the various grandfather clause exemptions currently enjoyed by EMI are no longer in effect.
- ✓ Working with the East Maui community to create models for community stewardship and educational programs that operate the EMI system in the long-term.

As note previously, if an entity is interested in purchasing the EMI Aqueduct system as a reasonable price, with minimal long-term debt, given current interest rates, and a recent purchase price of \$5.4 million (less than a year ago ago), and the fact that a 30-year water lease may increase the delivery system cost, initial steps should be taken while the system is extremely affordable.

Thank you for taking an interest in the work of the Board of Water Supply's Temporary Investigative Group. Please feel free to contact TIC Chair Norman Franco at normanfranco@hotmail.com or Vice Chair Shay Chan Hodges at shay.chanhodges@gmail.com if you have any further questions.

Respectfully submitted by,

The Board of Water Supply Temporary Investigative Group for Determining the Feasibility of Purchasing and Maintaining the EMI Water Delivery System

Board of Water Supply

Temporary Investigative Group (TIG)

Research Notes, October 4, 2019

This document contains notes from the research conducted by the Board of Water Supply TIG as of October 4, 2019. These notes should not be construed as representing conclusions or recommendations of the TIG, and are provided in the public interest for discussion purposes.

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I. TIG Investigation Background:

Stated Purpose of the Investigation:

Explore the Feasibility of Purchasing and Maintaining the EMI Water Delivery System and Examine Other Alternatives for Ensuring That The People of Maui County Have Authority Over the Delivery of Water, Which is A Public Trust

Attempts to Access Information on Behalf of the Public:

Over the last several months the Maui County Board of Water Supply (BWS) has had several discussions regarding the role of Mahi Pono in the community. In a letter approved unanimously by the Board on September 19, 2019 to be sent to Mahi Pono Operations Manager Grant Nakama, contingent upon approval by Mayor Michael Victorino, the BWS stated the following:

...the [Maui County] Board [of Water Supply] has been extending invitations for Mahi Pono, LLC to attend one of our board meetings since March. We are very eager to have a continued dialog between the Board and Mahi Pono as we continually get testimony submissions and questions from the Maui community on water and land use subjects that are beyond our purview. A dialog between the Board and Mahi Pono can help mitigate any falsely placed frustrations throughout the community that are generated from the perceived lack of transparency from the Board when we don't have the answers to provide them.

As a Board that is dedicated to addressing matters related to safeguarding Maui residents' access to water, we are very interested in developing a clear vision of the island's total water resources and current and future demand. To that end, the Board has recently reached out to all private water purveyors and extended invitations to meetings. These invitations have been extended in order to gain an inclusive picture of the island water resources and delivery options as well as to see if there are untapped opportunities for County and private water purveyors to support one another.

Based on statements made in your July 1 letter and discussions during recent meetings, the Board would still welcome your attendance at our next meeting. If that

cannot be arranged, we would like to extend some follow-up questions regarding Mahi Pono's current and future plans as they relate to water use. Having some answers to these questions that we pose here will help us to communicate with the wider Maui community that has been addressing the Board. For example: In your July 1 letter, you state: **"We have always been committed to supplying the County of Maui – and by extension, the Upcountry Maui community – with water from the EMI system. Having said that, our ability to supply water is 100% dependent on our right to legally access and deliver water."** You further state, "That said, if a [Revocable Permit] is successfully obtained – whether by A&B, EMI or by Mahi Pono – then the County will continue to receive water for the Upcountry Maui community." We appreciate the clarity of this statement but the follow up to this is what will happen if Mahi Pono does not obtain a Revocable Permit to divert water?

"We would greatly appreciate any clarity that Mahi Pono can provide on this list of questions that has been generated by or presented to the Board:

- **If Mahi Pono does not obtain a Revocable Permit, will Mahi Pono be able to still commit to working with the County of Maui to ensure affordable access to water for upcountry Maui residents?**
- **Since the water that flows from the Wailoa Ditch to the Kamole Treatment Plant is maintained by Mahi Pono and EMI, would the lack of a Revocable Permit cease that ditch maintenance and flow?**
- Is Mahi Pono interested in exploring an agreement to provide water that is harvested from its own lands to the County's Kamole Water Treatment plant?
- Is Mahi Pono willing to consider shared management of the Wailoa Ditch and other ditch systems? The current condition of the ditch system and the cost of maintenance/repairs that are needed would help clarify the monetary constraints of providing water to the Kamole Water Treatment plant, and
- If the water leases are obtained by EMI, what portion would go to Mahi Pono lands and what portion would go to remaining A&B lands, many of which are entitled for development? Are there other agreements besides the original sales agreement between Mahi Pono and A&B?"

(Bold added for emphasis, July 1, 2019 Grant Nakama letter and BWS draft letter attached, Appendices 1 and 2)

As noted in the letter, the Board of Water Supply has been reaching out to Mahi Pono since March, 2019. The only communication received from Mahi Pono was the letter referred to above from Mr. Nakama to Director Jeff Pearson, which Mr. Pearson has stated was intended to be shared with the BWS.

As a result of growing concerns about communication and transparency, a Temporary Investigative Committee to explore options for ensuring access to water was approved on July 18, 2019, including the following committee members:

- Water Board Chair Shay Chan Hodges
- Board Member Norman Franco
- Board Member Antoinette Eaton
- Board Member Joseph Aquino

Norman Franco was approved to be Chair of the TIG, Shay Chan Hodges was approved to be Vice Chair.

On July 23, 2019, Joseph Aquino resigned from the TIG due to work responsibilities.

Scope of investigation:

As approved on July 18, 2019, during its investigation, the temporary investigative group (TIG) may:

- a. Conduct interviews and discussions with County of Maui personnel related to the delivery of water to Upcountry and Central Maui.
- b. Conduct interviews and discussions with State of Hawaii personnel related to the delivery of water to Upcountry and Central Maui.
- c. Conduct interviews and discussions with anyone whom the TIG determines has the knowledge, expertise and experience necessary to assist TIG members in increasing their understanding of the scope, operations and maintenance of the EMI Water Delivery System as well as the costs related to the purchase or condemnation of the EMI water delivery system and the cost of its maintenance, including, if necessary, the purchase or condemnation of relevant Mahi Pono lands.
- d. Conduct interviews and discussions with anyone whom the TIG determines has the knowledge, expertise and experience necessary to assist TIG members in increasing their understanding of potential financial mechanisms and organizational structures necessary for the acquisition and governance of the EMI Water Delivery System, in order to promote system sustainability, ensure fiscal integrity, maximize the public welfare and maintain the public trust.
- e. Consult with representatives and stakeholders with diverse expertise relating to the TIG investigation.
- f. Review documents, contracts, studies and other written information relevant to the investigation.

Urgency of Investigation:

Mahi Pono's Intentions per the Draft EIS

On September 23, 2019, the East Maui Irrigation System (EMI) and Alexander & Baldwin (A&B) Draft Environmental Impact Statement (DEIS) for the *Proposed Lease (Water Lease) for the Nāhiku, Ke'anae, Honomano, and Hue/a License Areas*¹, situated at TMK Nos. (2) 1-2- 004:005, 007 (por.), 1-1-002:002, 1-1-001:044, 1-1-001:050, 2-9-014:001, 005, 011, 012, 017 in the Makawao and Hana Districts, on the island of Maui was released **to the public** by the Department of Land and Natural Resources.

The 2,700 page Draft Environmental Impact Statement provides a great deal of information regarding costs and plans, and is available online (see footnote). It is referenced throughout this report as "DEIS" with accompanying page numbers.

This document answers some of the questions posed by the Board. For example:

"Without the Water Lease, even if EMI could find it economically feasible to continue maintaining the EMI Aqueduct System to divert non-governmental water for diversified agriculture in Central Maui, **there may not be enough water to allocate much or any to the MDWS.** This lack of water would exacerbate the effects of drought when other surface water sources are unreliable for the KAP and the Nāhiku, this could eliminate their primary source of water. **Insufficient water delivered to the County through the EMI Aqueduct System could have significant effects on health and safety of those who currently rely on that water delivery.**"

(Bold added for emphasis, DEIS, *Page xiii, Relationship Between Local Short-term Uses of Humanity's Environment and the Maintenance and Enhancement of Long-Term Productivity*)

"The existing water delivery agreements with the MDWS are contingent upon the Water Lease being issued, therefore **if no Water Lease is issued, it is assumed that the delivery of water to the MDWS would terminate.** Under the Reduced Water Volume alternative, depending on the amount of water authorized under the Water Lease, the MDWS may receive no water from the Wailoa Ditch or some amount up to 7.1 mgd. **The greater the reduction in the amount authorized under the Water Lease, proportionally less water will be available to the MDWS.**"

(Bold added for emphasis, DEIS, *Page 3-5, 3.2 Alternative Analysis 3.2.1 Reduced Water Volume Alternative*)

¹ http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2019-09-23-MA-DEIS-East-Maui-Water-Lease.pdf

The DEIS describes the ownership relationship of EMI, Mahi Pono, and A&B in this way:

“the EMI Aqueduct System is owned and operated by the EMI. EMI was previously a wholly owned subsidiary of A&B. In February, 2019, MP EMI, LLC, became a co-owner of EMI. In addition to becoming the co-owner of the EMI Aqueduct System, as noted above, Mahi Pono acquired former sugarcane and watershed lands, including the Central Maui agricultural fields, from A&B in December 2018. Agricultural operations are centralized under Mahi Pono, LLC.” (DEIS, Page 1-2, The EMI Aqueduct System.)

It is unclear why Mahi Pono, a part-owner of the EMI Aqueduct system, is not a named party on the Draft EIS if Mahi Pono is intending to be a potential lessee. For the purposes of this document, the BWS TIG is referring to EMI/Mahi Pono as jointly responsible for any statements in the Draft EIS.

BWS TIG Obligations to the Public

The Board of Water Supply approved convening a “Temporary Investigative Committee to examine Alternatives for Ensuring That The People of Maui County Have Authority Over the Delivery of Water, Which is A Public Trust” in July, 2019, with no specific deadline for completion.

However, because Mahi Pono has not committed to working with the County of Maui to ensure affordable access to water for Upcountry Maui residents if a revocable permit or lease is not approved, and Mahi Pono/EMI has stated in the Draft Environmental Impact Statement that “if no Water Lease is issued, it is assumed that the delivery of water to the [Maui Department of Water Supply] would terminate,” and given that -- as stated in the DEIS -- “insufficient water delivered to the County through the EMI Aqueduct System could have significant effects on health and safety of those who currently rely on that water delivery,” it is clear to TIG members that actions to reduce reliance on a private company operating the EMI Delivery System represent a public health imperative and need to be taken immediately.

II. How the EMI System Impacts East Maui & Upcountry Maui:

Description of the EMI System Per the Draft Environmental Impact Statement:

The EMI Aqueduct System was constructed in phases, beginning in the 1870s and extending to its completion, as it currently stands, in 1923. It consists of approximately 388 separate intakes, 24 miles of ditches, and 50 miles of tunnels, as well as numerous small dams, intakes, pipes, 13 inverted siphons and flumes. **The EMI Aqueduct System collects surface stream water from approximately 50,000 acres of land (Collection Area), of which approximately 33,000 acres are owned by the State of Hawaii (which includes lands within Nāhiku, Keʻanae, Honomanū and Huelo) (License Area)², and the remaining approximately 17,000 acres which are privately owned by EMI and Mahi Pono.³**

The EMI Aqueduct system starts at Makapipi Stream, in the Nahiku portion of the License Area, with the Koolau Ditch. The Koolau Ditch traverses westward across the Keʻanae License Area and into the Honomanū License Area where it crosses paths with the Spreckles Ditch. This is where streams had multiple diversions at different levels to supply water to the EMI Aqueduct System. Separating higher elevation ditches allows them to maintain the very slight slope necessary to convey flows by gravity over long distances to irrigate higher elevation fields. This avoids the cost of energy required to pump water up from ditches delivering water at lower elevations. As the system continues westward, the Koolau Ditch transitions at the boundary between the Honomanū and Huelo portions of the License Area to the Wailoa Ditch. Makai of the Koolau/Wailoa Ditch, are the Manuel Luis and the Center Ditch. At Waikamoi Stream, the New Hamakua Ditch begins, running parallel to the Wailoa Ditch, but at a lower elevation.⁴

The Spreckles Ditch terminates its mauka segment at Waikamoi Stream, and begins its makai segment at Kaʻaiea Stream, until it converges with the Lowrie Ditch at Niliʻilihaele Stream. Makai of Lowrie Ditch is the Haiku Ditch. At Honopou Stream, the water collected within the License Area by the EMI Aqueduct System exits the License Area. Crossing this western boundary of the License Area in descending elevation are the Wailoa Ditch, the New Ditch, the Lowrie Ditch, and the Haiku Ditch. West of Honopou Stream, the EMI Aqueduct System traverses land that was largely owned by A&B and is now largely owned by Mahi Pono. Additional flows from streams located on this land are diverted by the EMI Aqueduct System until it crosses Maliko Gulch beyond which there are no stream diversions. Crossing Maliko Gulch in descending elevation are the Wailoa Ditch, Kauhikoa Ditch, Lowrie Ditch, and the Haiku Ditch.⁵

² DEIS, Page 1-2

³ DEIS, Page 2-4

⁴ DEIS, Page 2-4

⁵ DEIS, Page 2-4

Current Diversion by the EMI Delivery System As Stated in the Draft EIS:

Currently, the EMI Aqueduct System is only diverting approximately 20 mgd. As a result, very little surface stream water is currently being diverted relative to what would be allowed should the Water Lease be awarded per the Proposed Action. However, the amount of water that may be diverted should the Water Lease be issued is substantially less than the amount that was diverted during normal sugar production. For example, in 2006 it is estimated that the EMI Aqueduct System delivered approximately 156.69 mgd at Maliko Gulch, whereas under the CWRM D&O, it is estimated that the delivery at Maliko Gulch will be approximately 92.32 mgd (Akinaka, 2019).⁶

Description of Community Concerns as Relayed at Focus Group Per DEIS:

According to the DEIS, 4.7.2 Social Characteristics (Page 4-135):

A focus group with residents and farmers from Huelo and Ha 15, 2018 at Hale Akua in Huelo. Most of these participants live in the Huelo watershed area and many live and farm in areas adjacent to streams that are subject to the CWRM's and D&O.

Also, participants said that EMI personnel do not notify residents in the area when the gates open to allow downstream flow. The sudden onrush of stream water has endangered several people who happened to be in/near the stream at that time.

It was noted that, with the closing of the sugar plantation, the low level of maintenance has deteriorated even further given the reduction of EMI staffing to, reportedly, about eight people.

A second major concern with this group is fairness in how they, as a community, have been treated in two ways. First, they reported of the 25 streams in the petition before the CWRM, only three streams in the Huelo watershed were considered kalo streams and designated for full flow. While they agreed with such designation in other watersheds, they felt more streams in their area should have been considered.

Another fairness related concern raised by the group is that residents and farmers in Huelo and streams. Except for those whose properties have deeds allowing stream water access via pipes, most cannot access stream water. They cannot use the water for agriculture or domestic uses. Participants noted that they are off the electricity grid, and they are very interested in using stream flow for hydroelectricity. It was reported that there have been drought times in which residents had to truck in water even though they live next to streams. It was also said that those who were fortunate to have wells on their property share their water with neighbors during these times.

⁶ DEIS, Page 2-8

An issue often raised in the November 2018 focus group sessions was the reportedly poor condition of the EMI Aqueduct System. Interviewees also discussed this topic from the perspective of reducing water losses. They said that the reduction of water losses would reduce the amount of water required for agricultural operations.

These interviewees wanted to know how Mahi Pono will ensure that continued use of the EMI Aqueduct System will be monitored and operated for efficient use of water, which is valued as a public trust, an integral environmental resource, and essential for healthy ecosystems.

Interviewees pointed out that, even though the CWRM D&O restored several streams in East Maui, the social and cultural effects of historical and significant stream diversions have yet to be rectified. This belief was reiterated several times in the November 2018 focus groups and expressed by those interviewed.

While there has been interaction between Mahi Pono and East Maui residents, there still needs to be acknowledgement of past wrongs and a “path to healing” that will allow residents and the new landowner to have a constructive relationship.

Those interviewed understood that Mahi Pono is not responsible for whatever occurred during A&B’s tenure. Mahi Pono inherited a legacy that developed for over one hundred years. Nevertheless, to move forward as an integral part of the Maui community, Mahi Pono needs to “make pono” with East Maui so that everyone can move forward. One person said, “There needs to be apology, repentance and reparation.”

Description of EMI System Per Dept of Water Supply Draft Water Use & Development Plan for Ko`olau and Central Sectors:

Excerpted from the Maui Island Water Use And Development Plan Draft, Part III Regional Plans, Ko`olau Aquifer Sector Area (ASEA)⁷:

Transport of Stream Water from East Maui

The EMI collects surface water from the [Ko`olau] sector and delivers it to Hawaiian Commercial & Sugar’s (HC&S) Central Maui cane fields. Some of the water is also used to generate electrical power. **A relatively small amount of water is used for residential and agricultural use by the DWS for its Upcountry Maui Water Systems, which include the Upper Kula and Lower Kula Water Systems.** The EMI ditch system, which began construction in 1876, is the nation’s largest privately built and operated water system; it consists of approximately seventy-five (75) miles of ditches, tunnels, siphons, flumes, and reservoirs. The Ko`olau Department of

⁷ <https://waterresources.mauicounty.gov/DocumentCenter/View/223/Draft-Plan-Section-III-Chapter-17-PDF?bidId=>

Agriculture’s AWUDP (2004) listed the average delivery at 165 mgd with a delivery capacity of 435 mgd⁸.

Wailoa Ditch	195 mgd
New Hamakua Ditch	100 mgd
Lowrie Ditch	70 mgd
Ha`ikū Ditch	70 mgd
Total Capacity	435 mgd

In drought conditions, both the Lower and Upper Kula systems require supplemental surface water from Kamole Weir and groundwater pumped up to 4,000 feet. Under current agreement with EMI, MDWS receives 12 mgd from the Wailoa Ditch with an option for an additional 4 mgd. During periods of low flow, MDWS will receive a minimum allotment of 8.2 mgd with HC&S also receiving 8.2 mgd, or prorated shares if less water is available. Proposed amended IIFS could restrict Wailoa ditch off stream uses so that less than 7 mgd is available a few days a year. When more than 7 mgd is available under non-drought conditions, the proposed restored amount would come from EMI’s share of the 16.4 mgd. The 2017 Proposal and the current allocation between MDWS and EMI would allow sufficient ditch use for MDWS to meet current demand on the Upcountry system. Under normal flow, exceeding 16 mgd at Wailoa Ditch, and under an allocation of up to 12 mgd for MDWS, projected future demand of 16.4 mgd could also be met. Treatment of more than 6 mgd at the Kamole Weir will require expansion of the water treatment facility and storage construction. Future demand on the Upcountry system as a whole is addressed in the Central aquifer sector report.⁹

Water Use Maui Department of Water Supply Upcountry System

MDWS relies on three surface water sources, one of which is delivered by EMI through the Wailoa Ditch, and the other two through two MDWS higher elevation aqueducts maintained by EMI that transport water to Olinda and Kula, under a contractual agreement originated under the 1973 East Maui Water Agreement and subsequent agreements. MDWS and EMI diverts water from Ko`olau ASEA, conveyed to treatment plant facilities located in Ko`olau ASEA (Piiholo Water Treatment Facility) and the Central ASEA (Olinda and Kamole Weir Water Treatment Facilities)¹⁰.

Water Treatment Facility	Elevation	Conveyance System	Production Capacity	Average Production
Olinda	4,200 feet	Upper Kula Flume	2.0 mgd	1.6 mgd
Piiholo	2,900 feet	Lower Kula Flume	5.0 mgd	2.5 mgd
Kamole-Weir	1,120 feet	Wailoa Ditch	6.0 mgd	3.6 mgd

⁸ Ko`olau WUDP, Page 22

⁹ Ko`olau WUDP, Page 123

¹⁰ Ko`olau WUDP, Page 119

Excerpted from the Maui Island Water Use And Development Plan Draft, Part III Regional Plans, Central Aquifer Sector Area (ASEA):¹¹

The Olinda facility diverts water at the upper Waikamoi Flume from the Waikamoi, Puohokamoa, and Haipuena Streams. Water is stored in two 15 million gallon reservoirs and one 100-million gallon reservoir. The Piiholo facility diverts water from the Waikamoi, Puohokamoa, Haipuena Streams and Honomanu streams into a 50-million gallon reservoir. The Kamole-Weir facility relies on EMI diversions from eastern most Makapipi stream to the western most Honopou stream.

The Upcountry system spans Ko`olau and Central aquifer sectors, ...and serves about 35,200 people. MDWS also serves non potable water to 31 farm lots at the Kula Agricultural Park (KAP). Current water use at the KAP is about 0.4 mgd. About 80 – 90 percent of the delivered water comes from surface water sources and the remaining portion from basal aquifer wells. Haiku Well and Kaupakalua Well are located in the Ko`olau ASEA, Hamakuapoko Well 1 & 2 and Po`okela Well are located in the Central ASEA. The combined surface and groundwater source production capacity is 17.9 mgd, 13 mgd from surface water and 4.9 mgd from groundwater. Accounting for system and operational limitations, and use restrictions from Hamakuapoko wells, the reliable capacity is 9.1 mgd. Current water use averages 7.9 mgd within a range of 6 – 10 mgd.

The DOH divides the MDWS Upcountry System into three separate systems: Upper Kula; Lower Kula and the Makawao systems, although all three are interconnected.

MDWS Makawao/Upcountry Water System (PWS 213)

The MDWS Makawao/Upcountry System, also referred to as Makawao District by the DOH, generally serves the area extending from Ha`iku, Makawao, and Pukalani to Hali`imaile/Pa`ia. The system has 6,680 meters and serves about 28,702 people. The sources of water are primarily from surface water imported from East Maui (80%) and well water (20%) from the Haiku and Makawao aquifers. Surface water from the Wailoa Ditch, generated in the Ko`olau ASEA, is treated at the Kamole Water Treatment Facility (WTF). The facility uses micro-filtration technology and is the largest surface water treatment facility on Maui. It has four booster pumps to move water up to the 2,800 foot elevation, where it can be pumped to the highest service areas at 4,500 feet. Historically, the Kamole WTF is the primary source of water for nearly all of Upcountry during times of drought. There is no raw water storage at the WTF.

MDWS Lower Kula/Upcountry Water System [PWS 247]

The MDWS Lower Kula/Upcountry System, also referred to as Lower Kula District by the DOH, generally serves the area extending from Kula Kai to Omaopio to mid and lower Kimo Drive areas. The system has 1,064 meters and serves about 3,192 people. The sources of water are primarily from surface water imported from East Maui treated at the Piiholo WTF. The facility

¹¹ <https://waterresources.mauicounty.gov/DocumentCenter/View/221/Draft-Plan-Section-III-Chapter-15-PDF?bidId=>, Page 45, 46

uses direct filtration technology. Granular activated carbon and air stripping treatments were added in 2015 to reduce disinfection-byproducts in the water supply. The system can be supplemented with groundwater from Makawao aquifer.

MDWS Upper Kula/Upcountry Water System [PWS 215]

The MDWS Upper Kula/Upcountry System, also referred to as Upper Kula District by the DOH, generally serves the area extending from Upper Kula to Kula Highlands to Kama`ole to Upper Olinda-Piihola to Kula Glen to Ulupalakua-Kanaio. The system has 2,346 meters and serves about 7,038 people. The source of water is primarily from surface water from Waikamoi treated at the Olinda WTF. The facility uses micro-filtration technology. Disinfection is provided by anhydrous ammonia, blended with chlorine to form chloramines. Water is stored in 30 MG Waikamoi Reservoirs and the 100 MG Kahakapao Reservoirs.

Future Water Use MDWS Upcountry System

Based on growth rates and the socio-economic forecast referenced in the Maui Island Plan, the population Upcountry is projected to grow by about 8,424 to a total of about 43,675 people by 2030. Projected water demand for the base, low and high growth scenarios are shown below.

Water losses due to leaks, seepage, evaporation and other inefficiencies in the treatment, conveyance, distribution and storage of water range widely depending on storage and source transmission system age, length, type and many other factors. To account for water losses and determine source needs for Upcountry, water produced, rather than water billed is used as basis to determine source needs. For the Upcountry system, water losses average 20%.¹²

Table 16-56 Projected Consumption and Production MDWS Upcountry District System, Base, High and Low Scenarios (mgd)

	2014	2035 Base	2035 High	2035 Low
Consumption	6.26	7.02	7.57	6.42
Production	7.61	8.53	9.20	7.80

*Excludes Kula Ag Park

Upcountry Meter List

In 1993, the MDWS determined that the existing Upcountry water system was found to have insufficient water supply developed for fire protection, domestic and irrigation purposes to add new or additional water services without detriment to those already served.

¹² Ko`olau WUDP, Page 121

MDWS created a list of Upcountry properties, by date of application, who requested new and additional water service. In 2002, an administrative rule “Water Meter Issuance Rule for the Upcountry Water System”, Title 16, Chapter 106 was created. The rule outlined the procedure for processing applications for water service. New applicants were continually added to the list until provisions were codified in 2013 so that no new applications were accepted after the 2013 provisions became effective. A 2015 ordinance provided certain fire protection exemptions. Still, about half of meter offers are declined presumably due to the expense of required system improvements. The Priority List is estimated to represent an additional 3.7 – 7.3 mgd demand on the Upcountry system as a whole. There are about 1,800 requests for 4,300 meters (excluding those that did not accept a reservation offered, accepted a reservation, or where a meter was installed) for 1,900 dwelling units and a nominal number of commercial units. About two-thirds of the remaining requests are located outside designated growth areas. There remains uncertainty over the number and timing of new meters as well as occupancy.

Sources for requests in Haiku are primarily served by basal wells with sufficient backup capacity to reliably add new services. Sources for requests on the Lower and Upper Kula subsystems are East Maui streams in the Waikamoi area that are subject to Instream Flow Standards and vulnerable to drought. Groundwater from Po`okela Well in Makawao aquifer can supplement the Lower and Upper Kula subsystems. There remains uncertainty over the number and timing of new meters as well as occupancy.

Providing reliable capacity to satisfy the Priority List could be accomplished in alternative ways:

1. Develop basal wells to provide reliable capacity and assume significantly higher cost of service due to energy required to pump up to 4,000 foot elevation
2. Separate the Priority List by service area and source, so that subsystems with adequate and reliable capacity are prioritized over subsystems reliant on surface water.
3. Public-private partnerships to develop source and infrastructure that benefit end users of the same subsystem.

Altering the priority list processing would require code changes and would without doubt cause opposition by applicants that would not benefit from such changes. The recommended strategy is assessing the various options of restructuring and processing the list while moving forward with needed source development.

Strategy #2: Assess alternative options to restructure and process the existing Upcountry Meter Priority List to improve processing rate and adequate source development. Lead agency is MDWS. ¹³

¹³ Central WUPD, Page 106-107

II. Strategies for Creating and Conserving Fresh Water Capacity

Hawaii Fresh Water Blueprint for Action:

Excerpted from website:¹⁴

Hawai'i has been blessed with consistent rainfall, advantageous geology, and high-quality drinking water stores for centuries. **Recent findings, however, have raised concern about long-term fresh water security for our Islands. University of Hawai'i and other scientists have documented troubling trends including reduced rainfall, higher evaporation rates, and declining stream flows in recent decades.** These findings, coupled with the demand of an ever-increasing population, suggest that Hawai'i is entering an era of fresh water uncertainty.

The Hawai'i Fresh Water Initiative (Initiative) was launched in 2013 to bring multiple, diverse parties together to develop a forward-thinking and consensus-based strategy to increase water security for the Hawaiian Islands. Organized by the independent, nonprofit Hawai'i Community Foundation (HCF), the Initiative relied on a blue ribbon advisory panel of individuals (Hawai'i Fresh Water Council or Council) with deep knowledge of water and a collaborative spirit to articulate a vision for a more secure and sustainable water future based on shared values, and shared sacrifice. This Blueprint is the result of their work, and provides Hawai'i policy and decision-makers with a set of solutions that have broad, multi-sector support in the fresh water community that should be adopted over the next three years to put Hawai'i on a path toward water security. The Blueprint also builds on the good work, findings, and recommendations over the years by preceding stewards of Hawai'i's most important resource.

Goal: The Fresh Water Council distilled nearly two years of research and analysis into a single goal: creating 100 million gallons per day (mgd) in additional reliable fresh water capacity for island by 2030.

To achieve the ambitious goal of 100 mgd in additional fresh water capacity, the group outlined three aggressive water strategy areas and individual targets that the public and private sectors must work together to achieve by 2030:

1. **Conservation:** Improve the efficiency of our population's total daily fresh groundwater water use rate by 8% from the current 330 gallons per day/person to 305 gallons per day/person. By 2030, this goal will provide 40 mgd in increased water availability.

¹⁴ https://www.hawaiicommunityfoundation.org/file/cat/Fresh_Water_Blueprint_FINAL_062215_small.pdf, Page 3

2. **Recharge:** Increase Hawai'i's ability to capture rainwater in key aquifer areas by improving storm water capture and nearly doubling the size of our actively protected watershed areas. By 2030, this goal will provide 30 mgd in increased water availability.
3. **Reuse:** More than double the amount of wastewater currently being reused in the Islands to 50 mgd. By 2030, this goal will provide an additional 30 mgd in increased water availability.

Initiative Principles¹⁵

The following shared principles were adopted by the Council as they forged consensus to adopt the policy recommendations listed in this section.

- *Water is a complex issue that demands a comprehensive set of solutions.**
- *Solutions will come from many different sectors, and a good solution in one geographic area may not be appropriate for another area.
- *Solutions should focus on financial sustainability and cost effectiveness.**
- *Better information and access to accurate data facilitates good decision-making.**
- *Entering an era of climate unpredictability argues for more aggressive gathering and monitoring of water data than currently occurs.**
- *"Applied" and/or "targeted" education efforts are more effective than general outreach and awareness campaigns.
- *Water is as important to our economy and culture as it is to our ecology.**
- *The current price of water in Hawai'i does not reflect its "true cost."**
- *Any successful supply solution must provide for Hawai'i's broad spectrum of water uses.**
- *Hawai'i is better-positioned than many other geopolitical bodies to meaningfully address long-term fresh water sustainability.
- *Native Hawaiian cultural traditions place a high value on water and can provide guidance on how best to steward water.**
- *Public Trust doctrine and our state water code provide an adaptable framework.**
- *There is an urgency to the fresh water supply issue that is not widely evident to the public.**
- *Costs to address fresh water supply will rise with each year of delay.**
- *The nexus between water and energy is clear and compelling.**

¹⁵ Fresh Water Blueprint, Page 13

Maui Strategies for Addressing Impacts of the Climate Crisis:

From the Central ASEA Draft Water Use and Development Plan¹⁶:

Issue and Background: Data and research suggest that Hawai'i should be prepared for a future with a warmer climate, diminishing rainfall, declining stream base flows, decreasing groundwater recharge and storage, and increased coastal groundwater salinity, among other impacts associated with drought. Reliance on surface water will become more uncertain in a future of longer droughts and varying rainfall. No streamflow projections are available for the coming century but projections include a decline in base flow and low flows, with stream flows becoming more variable and unstable (flashy), especially in wet years. Groundwater recharge decreases in drought but local impact from climate change has not been projected to date.

The Central ASEA is especially vulnerable due to water resources used:

- Upcountry region and agriculture dependent on surface water as primary resource.
- Irrigation and other non-potable wells in Paia and Kamaole aquifer coastal areas are subject to sea-level rise

In consistency with the *Climate Change Adaptation Priority Guidelines*, water purveyors should increase resilience and reduce vulnerability to risks related to climate change. Chapter 12 Island Wide Strategies in this plan include the following strategies that can mitigate impacts from climate change:

1. Continue Maui County financial support for watershed management partnerships' fencing and weed eradication efforts (Chapter 12.3, Strategy#1). The Central ASEA is heavily dependent on forested watersheds in the Wailuku and Ko'olau hydrologic units to provide fresh water supplies.
2. Demand side conservation measures, such as water conserving design and landscaping in new development, incentives for efficient irrigation systems, landscape ordinance and promoting xeriscaping in dry areas will increase tolerance for prolonged droughts. (Chapter 12.3 Strategies # 13, 14, 15, 17)
3. Promote alternative resource incentives, such as greywater systems and rainwater catchment to supplement conventional resources. Incentives for green infrastructure and use of alternative water sources are needed to ensure such upfront investments in new development. (Chapter 12.3 Strategies# 20 and 21)
4. Diversify supply for agricultural use to increase reliability. Under extended droughts and low stream flows, diversified agriculture on HC&S lands will compete with priority public trust uses for surface water. Planned extension of R-2 recycled water from the Kahului WWTF to HC&S fields can supplement groundwater from the Central aquifer sector. (Chapter 12.3 Strategy #51).

¹⁶ Central WUDP, Page 124

5. Expand requirements for new development to connect to recycled water infrastructure, promote closer collaboration between MDWS and MDEM to utilize Drinking Water State Revolving Funds to maximize recycled water use. (Chapter 12.3 Strategies # 61 and 62)
6. Explore and promote opportunities for large volume stormwater runoff for agricultural irrigation. (Chapter 12.3 Strategy # 66)

From the Ko`olau ASEA Draft Water Use and Development Plan:

The concerns regarding climate change in the Ko`olau aquifer are more general. References include:

- Improving the understanding of the concepts of "precautionary planning" to reduce and adapt to the effects of drought and climate change upon water resource availability and quality is important. ¹⁷
- Understanding potential impact of climate change adds to uncertainty in long-term groundwater availability. The primary responsibility to determine potential impacts on water resource availability lies with the State CWRM who in turn relies on studies and predictions by the scientific community and other agencies. Water purveyors need guidance how to mitigate and adjust to potential changes in groundwater availability. ¹⁸
- Strategy #3: Support collaborative hydrogeological studies to inform impact from climate change and future well development on groundwater health for Haiku and Honopou aquifers. ¹⁹

Upcountry Conservation:

The Upcountry region has experienced voluntary and mandatory conservation measures for decades, primarily in dry season when the MDWS Upcountry System reservoir levels are low. Reliance on surface water and constraints in developing additional groundwater causes the system to be vulnerable to droughts.

Demand Side Conservation Measures

Demand side conservation strategies recommended in Section 12.2 that would target outdoor uses of potable water include comprehensive water conservation ordinance to include xeriscaping regulations, landscaping and water efficient irrigation system incentives.

¹⁷ Ko`olau WUDP, Page 4

¹⁸ Ko`olau WUDP, Page 104

¹⁹ Ko`olau WUDP, Page 105

In evaluating cost-effectiveness, MDWS compared the costs to develop and deliver new sources of water to meet future demand with the savings attributed to conservation.

A preliminary analysis of the proposed conservation measure portfolio outlined in Section 12.2 shows that doubling current investments (MDWS annual FY14 – FY17 conservation budget, excluding leak detection is \$170,000) would result in net capital and operational savings. The potential for a net savings is expected for both the MDWS Central System and the Upcountry System due to the need for new source development.

Recommended demand side conservation measures at all levels and type of use for public water systems are outlined in table 13-1 (strategies # 10 – 25). There is an opportunity to design and implement conservation measures in new housing development throughout planned growth areas. The recommended conservation Strategies #17, 22 and 25 outlined in Table 13-1 are implemented in the design and build phase and are especially appropriate in planned growth areas:

- Revise county code to require high efficiency fixtures in all new construction. Develop a comprehensive water conservation ordinance to include xeriscaping regulations.
- Revise County Code: Water conserving design and landscaping in new development (xeriscaping targets dry areas).
- Revise County Code and/or incentivize water- efficient building design that integrates alternative sources (grey water, catchment).

Supply Side Conservation Measures

The sustainable and efficient use of water resources, as well as the capacity and integrity of water systems, can be improved by accounting for water as it moves through the system and taking actions to ensure that water loss is prevented and reduced to the extent feasible.

A water audit provides a data driven analysis of water flowing through a water system from source to customer point-of-service and is the critical first step in determining water supply efficiency and responsible actions to manage and reduce water loss consistent with available source, operational and financial resources. Public water systems serving a population of 1,000 or more and those within water management areas regardless of population served are required to submit annual water audits beginning July 1, 2020. Except for the MDWS systems, there are no large public water systems in the aquifer sector subject to the requirement. The fiscal year 2017 audit for the Upcountry system revealed that apparent water losses are often due to data gaps between the amount of water withdrawn at the source, treated, stored and billed. The results will guide MDWS data collection, maintenance and repair programs.

Input from the WUDP public process and issues identified in the community plans relate to water shortages and conservation²⁰:

- Reliance on surface water Upcountry makes the system vulnerable to drought conditions
- Voluntary and mandatory water use restrictions imposed on residential and agricultural users during droughts often negatively impact the productivity of farmers
- Promote conservation of potable water through use of treated wastewater effluent for irrigation.
- Reuse treated effluent from the County's wastewater treatment system for irrigation and other suitable purposes in a manner that is environmentally sound.
- Provide incentives for water and energy conservation practices.
- Promote energy conservation and renewable energy.
- Incorporate drought-tolerant plant species and xeriscaping in future landscape planting.

Qualitative criteria to evaluate and measure resource strategies against this planning objective include:

- Per capita water use decreased
- Potable and irrigation systems water loss decreased
- Community water education increased
- Incentives for water conservation increased
- Renewable energy use increased

East Maui Watershed Management:

East Maui watersheds are predominately vegetated by native Hawaiian rainforest. The plants there evolved over millions of years into the most efficient water collection system for our island's geography. It works in layers – tall 'ōhi'a and koa trees provide a canopy for shorter trees, while shrubs and ferns fill in underneath, and a thick layer of mosses and leaf litter complete the floor. These layers act like a giant sponge, slowing down heavy raindrops and soaking up water for slow release into underground aquifers. Even during droughts, our watersheds can produce water, pulling water out of the clouds by collecting fog drip. This uniquely evolved, specialized forest is the key to Maui's healthy water supply harbor endemic and rare native plant and bird species. The main threats to the native forest and ecosystems are habitat loss and alterations due to feral ungulates (pigs, deer, goats) and invasive plants. These are detrimental both to biodiversity and water supply.

Active management to ensure protection and preservation of these important watershed lands occur on federal, state and community levels.²¹

²⁰ Central WUDP, Page 102

Central Draft Water Use and Development Plan²²:

Issue and Background: Most land within this hydrologic unit are water resource “import” areas, rather than “export” areas in the sense that population and agricultural operations rely on water resources from adjacent watersheds. Watershed management in both types of watersheds are important. The Department of Land and Natural Resources has identified “Priority Watershed Areas” which are areas of highest rainfall and resupply, based on climatic conditions that provide high recharge and fog capture. Currently protective measures are focused in these priority areas above the 3,000 foot elevation with direct benefit to makai lands and the nearshore environment. The East Maui Watershed Partnership (EMWP) manages most of the forested upper critical watersheds of Ko`olau aquifer sector. Ongoing efforts include ungulate control through fence construction, retrofitting and regular trap checks weed management, monitoring, and human activities management through outreach and education. On the dry side of Haleakala, the Leeward Haleakala Watershed Restoration Partnership (LHWRP) works towards restoring the disturbed landscape where once dryland forests captured rain and fog that recharged the freshwater supply. The Maui Invasive Species Committee (MISC) targets pest animals and plant species to prevent their influx and establishment in the mauka critical watersheds. Their efforts occur throughout the Central ASEA in rural and agricultural regions as needed.

The Makawao-Pukalani-Kula Community Plan states as objectives:

- *Recognize the importance of the forested watershed areas and that their health and well-being are vital to all the residents of the Upcountry area.*
 - *Explore a comprehensive reforestation program to increase and catch more rainwater for the Upcountry area.*
-

The objectives support the ongoing efforts by EMWP, LHWRP and MISC. State and county agencies as well as private purveyors can provide financial support and participation in watershed protection partnerships and reforestation programs. Strategies for watershed management in Ko`olau is addressed in the Ko`olau ASEA Report, Chapter 16.8.1. Management efforts on leeward Haleakala is addressed in the Kahikinui ASEA Report, Chapter 18.8.1

²¹ Ko`olau WUDP, Page 99

²² Central, WUDP, Page 100, 101

Nexus Between EMI Delivery System & East Maui Watershed:

<p>A detailed environmental and cost analysis of Watershed Management and Restoration building on the Water Use and Development Plan is needed.</p>	<p>In order to ensure optimum implementation of any recommendations, agreements with landowners and considerations of land purchases would be required.</p>
<p>The Hawaii Fresh Water Initiative calls for investment in watershed protection statewide as a crucial step for water security. Consistent, reliable public funding is the most difficult and important part of watershed protection and storm water capture.²³</p>	<p>One recent University of Hawai'i Economic Research Organization (UHERO) study estimated that investing \$43.2 million in watershed restoration work in the Ko'olau mountains could result in over \$900 million in actual realized water value for O'ahu.²⁴</p>
<p>Current commitments to management and restoration by Maui County are extremely low.</p> <p>Watershed Partnership Annual Contributions?</p>	<p>2020 Budget: less than \$2 million (\$1 million according to WUDP)</p>
<p>Various computer climate models predict divergent precipitation futures for Hawai'i, although there seems to be common agreement that our rainfall future will be increasingly extreme and inconsistent. There is also high variation throughout the islands in terms of each watershed's ability to catch and hold water. In sum, the question is not whether Hawai'i will have water in the future, but rather will Hawai'i continue to have an affordable, predictable supply in the places we need at the times that we need for a growing population?"²⁵</p>	<ul style="list-style-type: none"> • Rainfall in Hawai'i decreased by 18% over a 30 year period in Hawai'i from 1978 to 2007. • Annual "tradewind days" have declined 28% from 291 days in 1973 to 210 days in 2009, resulting in less rain and recharge of aquifers. • Hawai'i has been feeling the impact of prolonged drought. In the summer of 2013, 75% of Hawai'i's land area was "Abnormally Dry." • Groundwater provides 99% of the state's domestic water use and in several key areas groundwater levels have been dropping. • Increased temperatures associated with global warming mean increased evaporation for surface water and soil moisture. <p>Certain invasive plant and tree species have higher evapotranspiration rates than native species in Hawai'i. Hawai'i forests are increasingly encroached on by invasives.²⁶</p>
<p>There are no specific commitments to Management and Restoration of the East Maui Watershed by Mahi Pono/EMI in the Draft EIS</p>	<p>Page 2-2, DEIS: Under the Proposed Action, it is anticipated that EMI and/or Mahi Pono will continue to pursue watershed management activities."</p>
<p>Commitments to providing water for taro farming are crucial to the care of the watershed.</p>	<p>For centuries after their arrival from Polynesia, Native Hawaiians divided the land into <i>ahupua'a</i> — subdivisions running from the ocean to the mountains, roughly defined by their watersheds. Fresh water flowed through complex ditch systems called <i>'auwai</i>, often toward taro <i>lo'i</i>, where it supported the cultivation of hundreds of variety of taro—a dietary mainstay for the population. Intact native forests in the <i>wao akua</i>, along</p>

²³ Fresh Water Blueprint, Page 13

²⁴ Fresh Water Blueprint, Page 7

²⁵ Fresh Water Blueprint, Page 5

²⁶ Fresh Water Blueprint, Page 5

	with diversion systems of 'auwai and lo'i in the lowland areas slowed down water down and increased aquifer recharge in each watershed. ²⁷
8. State Department of Agriculture is providing \$4.5 million in 2020 to support local agriculture (currently a one-time allocation).	Supports the plans, design and construction for to rebuild auwai in Ke'anae-Wailuanui and similar rural water infrastructure projects, which indirectly helps the watershed by supporting lo'i (see above).

General Resource Management:

Planning objectives related to resource management identified in the WUDP update public process include:²⁸

- Watershed protection and its prioritization, including invasive alien plant control, ungulate control, and reforestation via watershed partnership programs
- Maintaining access to lands for gathering, hunting and other native Hawaiian traditional and customary practices
- Improving the understanding of the concepts of "precautionary planning" to reduce and adapt to the effects of drought and climate change upon water resource availability and quality
- Consultation and coordination with Native Hawaiian community/moku and local experts on resource management and invasive species removal

The Hāna Community Plan reflects regional issues expressed at the community WUDP meetings. Policies related to water resource management include:

- Protect, preserve and increase natural marine, coastal and inland resources, encouraging comprehensive resource management programs
- Ensure that groundwater and surface water resources are preserved and maintained at capacities and levels to meet the current and future domestic, agricultural, commercial, ecological and traditional cultural demands
- Recognize residents' traditional uses of the region's natural resources which balance environmental protection and self-sufficiency
- Discourage water or land development and activities which degrade the region's existing surface and groundwater quality
- Encourage resource management programs that maintain and re-establish indigenous and endemic flora and fauna
- Protect, restore and preserve native aquatic habitats and resources within and along streams

²⁷ Fresh Water Blueprint, Page 9

²⁸ Ko'olau WUDP, Page 99

- Ensure that the development of new water sources does not adversely affect in-stream flows
- Increase water storage capacity with a reserve for drought periods.
- Improve the existing potable water distribution system and develop new potable water sources prior to further expansion of the State Urban District boundary or major subdivision of land in the State Agricultural or Rural Districts.
- Ensure adequate supply of groundwater to residents of the region before water is transported to other regions of the island.

Key issues for the Ko`olau region were identified in public meetings held in Hāna over 2016. Community concerns overlap with those of the Hāna aquifer sector and relate to watershed management and participation by the local community; maintenance of traditional resource management using the ahupua`a system and ensuring that traditional and customary practices are safe guarded. Community members state that younger generations are returning to Ko`olau and Hāna to establish taro lo`i. Other key issues for the region focus on providing affordable water for future needs, providing for taro lo`i and other public trust uses during droughts, and managing resources in a sustainable way.

Due to resource interdependencies, East Maui (Hāna and Ko`olau ASEAs) community concerns are also related to the primary concerns of Makawao-Pukalani-Kula residents, which center on the limited development of water resources and a distribution system to meet the needs of the region. The proper allocation of water resources is considered essential to, in order of priority:

(1) preserve agriculture as the region's principal economic activity, promote diversified agricultural activities, and effectively encourage the development of Department of Hawaiian Home Lands (DHHL) parcels; and

(2) However, water use in the Upcountry region is recognized as having impacts on the streams of East Maui and the agricultural activities of the central valley.

A comprehensive water management strategy must be developed to strike a balance between the various interests and accommodate environmental, agricultural and on Upcountry and East Maui water issues as they relate to each other and the Central Maui ASEA.²⁹

²⁹ Ko`olau WUDP, Page 98

III. Native Hawaiian Land & Water Rights

Ko`olau Water Use and Development Plan, DHHL Maui Island Plan:

The Hawaiian Homes Commission adopted its Maui Island Plan as the overarching planning document in 2004. The Department of Hawaiian Homelands (DHHL) East Maui planning region encompasses three tracts totaling 985 acres: Ke`anae, Wākiu, and Wailua. All three tracts are within the Hāna Community Plan designated Area. However, only Ke`anae (150.6 acres) and Wailua tracts are within the Ko`alau ASEA, covering 242 acres the State Land Use Commission has mostly zoned Agriculture, with a very small percentage zoned Conservation. The County zoning and Community Plan designations for the lands is Agricultural. For the Ke`anae tract, Two acres of community use is proposed on the makai property, and 32 three- acre agricultural lots are proposed on 57 acres of the mauka property. The chosen DHHL project for the Wailua tract proposes 28 acres of subsistence agricultural use, 52 acres of General Agricultural use and 10 acres of Conservation.³⁰

Central Water Use and Development Plan DHHL Water Resources:

Due to the extensive Department of Hawaiian Homelands (DHHL) land holdings and their plans to further develop the area for Native Hawaiian habitation and farming activities; adequate water supply is becoming increasingly important for Native Hawaiians to resettle and facilitate their cultural practices in the area. DHHL lands are occupied by Native Hawaiians who are assumed to live the full-range of traditional Native Hawaiian cultural practices based on their ability to implement the knowledge of their heritage. Upcountry Maui (Keōkea/Waiohuli, Ulupalakua, Kualapa) has over 6,000 acres of DHHL lands.

The Makawao-Pukalani-Kula Community Plan section, "Identification of Major Problems and Opportunities of the Region Problems," cites "limited development of water resources and distribution system to meet the needs of the region as a primary concern," and notes that "The proper allocation of water resources is considered essential to encourage the development of Department of Hawaiian Home Lands (DHHL) parcel."³¹

Keōkea/Waiohuli – Priority Tract

According to the DHHL Maui Island Plan, with adequate water and funding, this area has the potential to be the largest homestead region on Maui. Over 6,000 acres of DHHL land are located below Kula Highway on the slopes of Haleakala. A 70-unit farm lot subdivision at Keōkea was planned prior to the *Maui Island Plan*. A second phase of 343 residential lots can be implemented using allocations from the existing water system if planned in the mid-section of the tract between existing residential lots and the Keōkea farm lots. An additional 768

³⁰ Ko`olau WUDP, P. 43

³¹ Central WUDP, Page 30

residential lots are proposed for future residential homesteads at Waiohuli pursuant to the development of an on-site production well.

Kualapa

Located along Kula Highway south of Ulupalakua near Kanaio, this tract does not have immediate development potential due to infrastructure constraints. The water system is old and undersized and is not able to accommodate any further growth; and extensive off-site improvements would be needed to support residential development.

Kula Residence Lots

The Kula Residence Lots subdivision is located in the northern portion of the Keōkea-Waiohuli homestead area (yellow on the accompanying map). The subdivision will include a total of 420 lots developed to Rural Residential half-acre standards.

Future DHHL Development

DHHL has long range conceptual plans for about 1,100 more residential lots in the area below the latest developments. The future subdivisions are envisioned to include community facilities, a school site, parks, archaeological preserves, and open space. These future plans are dependent on the development of water, wastewater, road improvements, and funding. The timeframe for these developments is beyond 2020.

Excerpts from Draft EIS Relating to DHHL Lands:

The DHHL staff has identified 11,455,510 gpd (10,428,000 gpd for K kea-Waiohuli + 1,027,510 gpd for Pulehunui) of water as their recommendation for a reservation of water rights sufficient to support current and future homestead needs related to this proposed Water Lease.

The DHHL has indicated that reserved water may be available for other purposes until the DHHL has an actual need for the water. For its K kea-Waiohuli and Pulehunui lands, the DHHL will be dependent on the EMI Aqueduct System collecting and transporting East Maui stream waters, in order to get waters to its lands. Until actual need materializes, the DHHL would receive payments related to lease rents paid by the lessee for those waters should EMI use a portion/all of the DHHL's Water Reservation, and the DHHL could receive other possible compensation or consideration.³²

IV. Considerations RE: Purchasing & Maintaining EMI System

The Maui County Board of Water Supply Temporary Investigative Committee has conducted interviews and discussions with various individuals in the community with knowledge, expertise and experience who have increased TIG members' understanding of the scope, operations and

³² DEIS, Page 2-4

maintenance of the EMI Water Delivery System as well as the costs related to the purchase or condemnation of the EMI water delivery system and the cost of its maintenance, and the purchase or condemnation of relevant Mahi Pono lands.

The BWS TIG has also reviewed various documents related to the above.

General Considerations

In response to community research, the BWS TIG learned that there are many members of the community who have been considering the option of purchasing the East Maui water delivery system and/or watersheds and had already begun their own analyses prior to the establishment of the TIG.

For Example the East Maui H2O Roundtable discussed the following:

<p>East Maui H2O Roundtable, convened by Sustainable Living Institute of Maui, June 2018, Break-out group on Financing strategies for East Maui Watershed and Water systems.</p>	<p>Participants: <i>ALLISON COHEN (Nature Conservancy)</i> <i>GLADYS BAISA (DWS DIRECTOR at the time)</i> <i>CARL FREEDMAN (economic analyst on water and energy policy)</i> <i>DAVID FISHER (Economist and business advisor)</i> <i>CAROL REIMAN- A&B Public relations head</i> <i>WARREN WATANABE- maui farm bureau</i> <i>LUCIENNE DE NAIE - Sierra Club Maui/ east Maui resident</i> <i>HUGH STARR- ag property specialist/ water researcher</i></p>
<p>Price tag depends on needed systems improvements and community priorities. Costs associated with watershed and ditch system (not County water treatment systems) include:</p> <ul style="list-style-type: none"> • <i>ditch system upkeep and maintenance</i> • <i>watershed management and restoration activities</i> • <i>monitoring gear / programs</i> • <i>alternative water sources</i> • <i>needed studies and plans</i> • <i>system modifications/ expansions</i> • <i>OHA/DHHL share</i> 	
<p>Funding Sources:</p> <ul style="list-style-type: none"> • System users • Private sector funding • International & local bonds • Social impact investors interested in : <ul style="list-style-type: none"> • sustainability • education • carbon offset • adopt a tree programs 	<ul style="list-style-type: none"> • NGO investors (charitable foundations) • Corporate sponsors • County • Federal appropriations (climate impact mitigation funds?) - USFWS/ USDA/ EPA- GRANTS • USGS programs and projects • State - Legislature plus CWRM/ OHA/ DHHL
<p>Determine pricing structure for portion of funding coming from potential water system users:</p> <ul style="list-style-type: none"> • DWS: potable system & ag parks 	

- A&B or successor- farming leases /hydropower
- taro farmers/ kuleana farmers
- Hui partition holders in Huelo
- Maui Gold pineapple
- Ranches
- Recreational users PUC would need to regulate the prices set & PUC bases decision on cost, not “value”

SIDEBAR: AG WATER RATES

- Charging 3 cents per 1000 gal , 100 mgd would cost \$1 million
- Upcountry farmers currently pay \$1.10/ 1000 gal at the County Ag park
- State irrigation district (hawaii island) charges 20 cents/ 1000 gal.

Condemnation Requirements (Per Maui County Corp Counsel)

In an August 2, 2017 transmittal from then-Corporation Counsel Pat Wong to then-Council Member Elle Cochran, advices is provided on the process for initiating condemnation proceedings by the County of Maui. Mr. Wong cites the following sections of the Hawaii Revised Statutes (HRS):

§46-1.5 (6) Each county shall have the power to exercise the power of condemnation by eminent domain when it is in the public interest to do so;

§46-61 Eminent domain; purposes for taking property. Each county shall have the following specific powers: To take private property for the purpose of establishing, laying out, extending and widening streets, avenues, boulevards, alleys, and other public highways and roads; for pumping stations, waterworks, reservoirs, wells, jails, police and fire stations, city halls, office and other public buildings, cemeteries, parks, playgrounds and public squares, public off-street parking facilities and accommodations, land from which to obtain earth, gravel, stones, and other material for the construction of roads and other public works and for rights-of-way for drains, sewers, pipe lines, aqueducts, and other conduits for distributing water to the public; for flood control; for reclamation of swamp lands; and other public uses within the purview of section 101-2 and also to take such excess over that needed for such public use or public improvement in cases where small remnants would otherwise be left or where other justifiable cause necessitates the taking to protect and preserve the contemplated improvement or public policy demands, the taking in connection with the improvement, and to sell or lease the excess property with such restrictions as may be dictated by considerations of public policy in order to protect and preserve the improvement; provided that when the excess property is disposed of by any county it shall be first offered to the abutting owners for a reasonable length of time and at a reasonable price and if such owners fail to take the same then it may be sold at public auction.

§46-62 Eminent domain; proceedings according to chapter 101. The proceedings to be taken on behalf of the county for the condemnation of property as provided in section 46-61, shall be taken and had in accordance with chapter 101, as the ame may be applicable.

§101-13 Exercise of power by county. Whenever any county deems it advisable or necessary to

exercise the right of eminent domain in the furtherance of any governmental power, the proceedings may be instituted as provided in section 101-14 after the governing authority (county council, or other governing board in the case of an independent board having control of its own funds) of the county has authorized such suit by resolution duly passed, or adopted and approved, as the case may be. The resolution, in the case of the city and county of Honolulu or an independent board thereof, shall, after its introduction, be published in a daily newspaper with the ayes and noes, once (Sundays and legal holidays excepted) at least three days before final action upon it, and in the case of any other county or an independent board thereof, be published in a newspaper with the ayes and noes, at least one day (Sundays and legal holidays excepted), before final action upon it.

§101-14 Plaintiff. The attorney general of the State may, at the request of the head of any department of the State, or as otherwise provided by law, institute proceedings for the condemnation of property as provided for in this part. Any county may institute proceedings in the name and on behalf of the county for the condemnation of property within the county for any of the purposes provided in this part which are within the powers granted to the county.

Section 4-2(7) of the Revised Charter of the County of Maui (1983) states: "Resolutions authorizing in eminent domain shall be adopted as provided by law."

Maui County Code Section 3.44.O15(E) states: "The council may authorize proceedings in eminent domain by resolution. Any proceedings so authorized are subject to the requirements of chapter 101, Hawaii Revised Statutes."

The remainder of HRS chapter 101 sets forth the process for completing condemnation proceedings. In summary, after the Council passes a resolution, the County is required to file a complaint in Circuit Court and provide notice of the action to all owners of the property. The County will be required to compensate the property owners for the property taken, and if the parties cannot agree on compensation, the Court will hold a trial on the issue.

Prior to drafting the resolution, the County should obtain a title report for the property, as well as an appraisal of the property's value. The appraised value of the property should be included in the County's budget. The resolution itself should authorize the Department of Corporation Counsel to initiate condemnation proceedings, specifically describe the property, state the public purpose proposed for the property, and authorize Corporation Counsel to deposit money equivalent to the estimated value of the property to obtain immediate possession, if applicable. It is also advisable for the Council work closely with the County department that will be responsible for oversight of the property throughout the condemnation proceedings.

In your request, you discuss the possibility of condemnation of the structures but not the land within the proposed property. Owning the structures without owning the land would limit the County's control of the land to effectuate the purpose of the condemnation.

Please see Appendix 5 for a copy of the transmittal.

In an email request from Board of Water Supply Chair and TIG Vice Chair Shay Chan Hodges, Corporation Counsel Caleb Rowe, stated the following:

“In general, when a condemnation occurs, the governmental body undertaking the condemnation must pay “fair market value” of the property taken. The Hawaii Supreme Court in its decision in Honolulu v. Collins (attached) specifically states that the value of use of water derived from the land shall be considered in a determination of fair market value (“this land has a special value as water producing land. The owners, therefore, are entitled to compensation according to its value as such.”)

The calculation of damages would be a little weird for this one since the system is technically on state land and the rights to the water are entirely speculative (dependent on the RP from BLNR). Still, some consideration of the value of water would likely be deemed appropriate in a determination of fair market value.”

See Appendix 6 for a copy of Honolulu vs. Collins.

Fair Market value of the EMI System

Market Value in 2018	Based on one-year old purchase price
1. Price paid by Mahi Pono in 2018:	\$5.4 million per the purchase and sales agreement with Mahi Pono Holdings as reported by Maui Time, \$5,442,333.48 per EIS.
2. Assuming that Mahi Pono did its due diligence and \$5.4 million was a fair price for the system last year, has the value increased or decreased since the time of purchase?	<p>Due to the reduction in agriculture, there has been reduced use of the aqueduct system over the last three years, and thus a reduction in EMI staff (as confirmed by Kamole Treatment Plant staff). It is likely that changes in delivery system use combined with less maintenance of ditches and the watershed would have a negative impact on the overall condition of the system.</p> <p>Central WUPD, Page 104: Public concerns were voiced over the EMI system falling into disrepair, inefficiencies due to unlined storage reservoirs and system losses. In the East Maui Streams Contested Case, system losses were assessed to about 22 percent. As sugarcane cultivation is transitioned to other uses, EMI continues to maintain the system and keeping the main ditches functional even with reduced volume flow. CWRM in its June 2018 decision encourages HC&S to seek to make its storage and delivery of water to its fields more efficient to increase the productive yield of the irrigation water from East Maui.</p>

True Value of the EMI System

Current condition of the EMI System:	
<p>1. Comprehensive information from EMI/Mahi Pono about the condition of the delivery system would be extremely useful to the community, not just for the purposes of determining market value, but for assessing overall impacts on the ecosystem, health, safety, and traditional and customary practices.</p> <p>The BWS TIG requested a copy of a safety analysis conducted by Oceanit a few years ago from EMI that might have provided valuable information about the state of the system, as well as recommended improvements. EMI/A&B declined to provide a copy of the report.</p>	<p>Based on the draft EIS, it is unclear what the current condition of the EMI system is. One statement indicates that there WILL be maintenance but does not clarify what the current maintenance is.</p> <p>Page 3-15, Draft EIS: <i>“ongoing maintenance and operation of the EMI Aqueduct System is expected to take place under all alternatives, to the extent operations and maintenance of the system is financially feasible.”</i></p> <p>Page 802, DEIS: <i>“The development and improvement of</i></p>

<p>BWS TIG requested a tour; which has not been scheduled by EMI yet.</p>	<p>the EMI Aqueduct System over time has cost nearly \$5,000,000, compared to its modern assessment of nearly \$200,000,000 to create a comparable system.”</p>
<p>2. Community Members provided feedback about the condition of the EMI Delivery System and the impacts on safety at focus groups convened for the Draft EIS.</p> <p>Page 4-121, DEIS: <i>Mr. Hau states that the EMI Aqueduct System requires mapping that shows the 388 intakes, ditches, dams, pipes, and flumes. Each diversion should be located and identified accurately with GPS coordinates. Elevations should also be recorded. The amount of water moving through the system should be measured at specific locations within the EMI Aqueduct System as well.</i></p>	<p>Page 4-135,DEIS: <i>As landowners and farmers downstream of the EMI Aqueduct System, two major concerns emerged among participants. First, many reported that the EMI Aqueduct System is not maintained in a manner that was safe for people in the area and located downstream. Focus group participants said that portions of the ditch area are so overgrown with vegetation that people visiting the area are injured if they stumble upon or fall into ditches and flumes that are not readily visible. Two bridges on State land often flood in this wet season, and people cannot drive to their residences until the water level subsides. It was felt that the bridges are unsafe because of a lack of maintenance.</i></p> <p><i>Also, people who visit popular areas in the vicinity of the State Forest Reserve, such as Twin Falls (which is partially within License Area; the upper falls are within the License Area but, the area that is frequently visited is outside the License Area), and area trails, noted that these areas are subject to overgrown landscaping and flash flood conditions. Participants noted that neither EMI nor the State has participated in maintenance of the EMI Aqueduct System and trails in this area, even though this area attracts residents and visitors alike.</i></p>

Operating Costs

Breakdown of Operations Per EMI/A&B:	Page 4-150, Draft EIS:
1. Personnel	EMI is expected to employ a staff of 17 people with a payroll of \$0.8 million. Total direct and indirect jobs is 24, with an associated payroll of \$1.1 million.
2. Operations	EMI's operating cost under the Proposed Action would be \$0.068 per kgal, which is higher than the current MDWS payment to EMI of \$0.06 per kgal. <i>(Includes personnel above and annual maintenance)</i> the 2030 water service fee rate is estimated to be \$0.10, which has been calculated based on the ratio of operational cost to the MDWS service fee for 2008 to 2013. Under this assumption, EMI would receive an estimated \$268,000 in 2030 from the MDWS
3. Taxes	GET revenue would be estimated at \$37,000 while payroll tax would be \$45,400 per year
4. Payments to DHHL and OHA	\$169,300 would be disbursed to OHA and \$254,000 would be set aside for the DHHL
5. State Leases	Based on appraisal.
6. Total operations	Page 2-1, DEIS: Total operational costs for labor, fringe benefits, materials, professional services, taxes, maintenance, anticipated rental payments to the State for the Water Lease, and other expenses are projected to be approximately \$2.5 million per year (Munekiyo, 2019).

Opportunities for Direct Cost Savings Through Improved Maintenance

Engineering study of the EMI system that assesses the cost-benefit of mitigating 20% losses is needed.	What are the funding options available for environmental assessments?
1. Given the amount of water that is lost through leakages on a regular basis, what would the savings be of proper repair and maintenance to the owner of the system, and would that savings offset any of the R&M costs?	Ko'olau WUDP, Page 121: "...water losses due to leaks, seepage, evaporation and other inefficiencies in the treatment, conveyance, distribution and storage of water range widely depending on storage and source transmission system age, length, type and many other factors...To account for water losses and determine source needs for Upcountry, water produced, rather than water billed is used as basis to determine source needs. For the Upcountry system, water losses average 20%. " USGS Civil Engineer/Hydrologist Matt Rosner is willing to come to Maui to measure stream flow and ditch flow at the 27 contested stream areas
2. What would the estimated increased availability of water to Upcountry residents be as a result of proper repair and maintenance?	
3. What would the impact be on overall East Maui stream restoration if less water needed to be diverted to supply Upcountry Maui?	

Opportunities for Indirect Cost Savings through Mitigating Health and Safety Risks

Health and Safety Considerations and Concerns, including Climate Crisis Impacts	In addition to direct costs, the County should look at other considerations that affect the well-being of Maui residents.
1. What are the safety concerns that would affect the community at large if the system is not properly maintained, regardless of ownership?	Page 3-14, DEIS: <i>Impact to historic properties. Components of the aqueduct system that deteriorate and begin to fail, such as broken ditch walls or collapsed tunnels, have the potential to alter natural drainage patterns and increase erosion in downstream areas that are outside of established stream channels. These areas have the potential to contain surface and subsurface historic properties that could be affected by flooding and erosion. (Mason Architects, 2019).</i>
2. What are the health and social effects on East Maui residents, including community impacts for intergenerational farmers returning to the valleys that have been without water for over a hundred years, if EMI Delivery system is not maintained optimally?	This would require a thorough study of the impacts of access to water on farmers and communities from a socio-economic perspective, looking at potential impacts of returns to East Maui.
3. How does maintenance of the EMI Delivery System impact Climate Crisis safety concerns with regard to flooding? <i>(Steps to be taken regarding climate crisis mitigation over the next thirty years were not in the DEIS although climate change is mentioned as a factor.)</i> Page 802, DEIS: The development and improvement of the EMI Aqueduct System over time has cost nearly \$5,000,000 , compared to its modern assessment of nearly \$200,000,000 to create a comparable system. <i>Long term improvements will be a fraction of the replacement cost of less than \$200 million (as estimated by the DEIS)</i>	Page 4-72, DEIS: <i>Climate change trends suggest increased potential for East Maui, including the License Area, to experience periods of intense, episodic rainfall where several inches of rain can fall in a matter of a few hours. With several streams being within East Maui, greater, episodic rainfall could increase stream flows and possible exceed the capacity of the EMI Aqueduct System as discussed in Section 4.3.1. The Modified Lease Area alternative could present risks to public safety if unfettered public access within the License Area meant more people could be put at risk due to stream flooding.</i>

Opportunities to Support Economic Development As Defined by the Community

The EMI Delivery System and Economic Development	The County should look at how public ownership would further support value-aligned economic options as defined by East Maui residents.
1. An analysis of the economic and social value of a well-maintained aqueduct system that supports local farming regardless of state laws governing stream flow standards would allow the County, if it were the owner, to support multiple stakeholder needs from a variety of perspectives.	Summary, Page 58, DEIS: <i>At full development, East Maui farms would produce about 1.0 million pounds per year of taro and about 400,000 pounds per year of other crops, resulting in \$2.9 million in direct and indirect sales per year. Farms would support a total of 21 direct and indirect jobs.. (Munekiyo, 2019).</i>
The impact of eliminating water loss on streams and waterfalls could be looked at from the visitor industry perspective.	What would loss of waterfalls impact be on tourism dollars?

Economic and Other Benefits of Accountability Regarding Streams Flows

<p>Although a number of legal decisions have supported the return of water to streams, there is a lack of funding for monitoring and enforcement</p>	<p>Public ownership of the water delivery system would provide transparency, accountability, and multiple remedy options to the public if laws are not followed.</p>
<p>1. As noted above, maintaining water in the streams has an impact on the watershed. There is also local and global environmental, community, tourism, energy, food security, and cultural value to being able to ensure that streams are being restored as ordered by the State.</p>	<p>The Code (HRS § 171C-3) defines “instream use” as: beneficial uses of stream water for significant purposes which are located in the stream and which are achieved by leaving the water in the stream. Instream uses include, but are not limited to:</p> <ol style="list-style-type: none"> 1. Maintenance of fish and wildlife habitats; 2. Outdoor recreational activities; 3. Maintenance of ecosystems such as estuaries, wetlands, and stream vegetation; 4. Aesthetic values such as waterfalls and scenic waterways; 5. Navigation; 6. Instream hydropower generation; 7. Maintenance of water quality; 8. The conveyance of irrigation and domestic water supplies to downstream points of diversion; and, 9. The protection of traditional and customary Hawaiian rights.
<p>2. If the water delivery system were publicly owned, there are more avenues already in place for pursuing robust and authentic engagement with East Maui families regarding care of diversion paths, including a community-based system of repair and maintenance (kuleana) which supports ongoing communication and relationship building.</p>	<p>Koʻolau WUDP, Page 15: There are 36 streams in the Koolau ASEA, that are classified as perennial. Of these streams, 31 are considered continuous and 5 are considered intermittent. The CWRM database indicates that there are 323 declared stream diversions in the Koʻolau ASEA and 11 gauges, of which, only three are “active.” Most of these diversions belong to the East Maui Irrigation Company (EMI).</p>
<p>3. Because EMI/Mahi Pono is requesting a 30-year lease, there will be no opportunities for the community to demand accountability until 2050, long after intense effects of climate change have impacted Maui.</p>	<p>Page 4-121, DEIS: In addition, Mr. Hau relayed via email that he recommends a five-year lease with constant updates due to the fact that the project description lacks information on the amount of water flowing through the EMI Aqueduct System and the actual amount of water collected at each diversion and/or ditch without the factor of climate change accounted for.</p>

Community Security Benefits

<p>In addition to weighing the cost/benefits of owning the EMI Aqueduct System in the context of providing domestic water to Maui residents, the County needs to consider the long-term benefits of having control over its water supply over the next 30 years.</p>	<p>How does control of the delivery system combined with the fact that water is a public trust support proactive access to water and system improvements?</p>
<p>If the County of Maui owns the EMI Delivery system, given that Act 126 specifically allows for the continued diversion of water to serve Upcountry Maui, it seems very likely that the County would be in a strong position to receive a long-term lease from DLNR. Having its own long-term lease would release the County from dependence on a private company for the health of the community.</p>	<p>Issuance of a long-term lease of State land from the Board of Land and Natural Resources pursuant to Hawai'i Revised Statutes (HRS) Section 171-58(c) would provide <i>the "right, privilege, and authority to enter and go upon"</i> state-owned license areas <i>"for the purpose of developing, diverting, transporting, and using government-owned waters"</i> including the right to go upon those State lands to maintain and repair existing access roads and trails used in connection with the privately owned water aqueduct system.</p>
<p>According to Director Jeff Pearson at the September 19, 2019 Meeting of the Board of Water Supply, the County of Maui would not be able to apply for a revocable permit or lease unless it owned the "diversion." As the owner of the EMI delivery system, the County would be able to apply for a lease.</p>	<p>Director Pearson made this statement in response to a recommendation by Senator Kai Kahele that Maui County apply for an RP immediately. Per Senator Kahele, the county is a domestic water provider, its rights are constitutionally protected. If they have an RP or a long term lease, no matter who runs the transmission system, they can always get water for Kamole. See attached Appendix #3</p>
<p>Having ownership of the system and its own Lease, the County of Maui would be able to ensure the public safety and support public access to the area as needed.</p>	<p>Page iii, DEIS: The Water Lease will enable the lessee to enter upon lands owned by the State of Hawai'i in order to maintain and repair existing access roads and trails used as part of the EMI Aqueduct System, and will allow continued operation of the EMI Aqueduct System.</p> <p>Beyond access to domestic water, there are also health and safety issues related to Climate Change for Upcountry Maui. Page 473, DEIS: Changes in precipitation may affect Upcountry Maui's ecosystems and communities include flooding, erosion, drought, and fire.</p>
<p>Because the County is a public entity, ownership of the delivery system combined with a long-term lease would provide access to public funding for maintenance of the system and restoration of wetlands that a private owner can't access.</p>	<p>A current example is the Department of Agriculture which is providing \$4.5 million in help restore stream access. The DoA cannot use the funds on private lands, such as EMI/Mahi Pono lands. Similarly, USDA and other funding that could be used to repair the EMI delivery system, could only be accessed if the system were owned by a public entity.</p>
<p>Public ownership of the delivery system – particularly if combined with lands owned by the County of Maui – would allow for more comprehensive systems oriented solutions to water needs by combining renewable energy, bio-fuel, farming plans that are tailored to</p>	<p>Water and farming plans that integrate analysis of use of curtailed wind energy for water pumping in agriculture and municipal systems can reduce agricultural water needs, lower energy costs for pumping water upcountry, and potentially increase stream flows. (Examples: A</p>

community needs, and efficient water systems.	Systems Approach for Investigating Water, Energy, and Food Scenarios in East-Central Maui ³³)
Public ownership would also allow for mechanisms that require a Water Management Plan, modeled on the Water Use and Development Plan, but with teeth.	Page 4-145, DEIS: <i>Interviewees stressed that Mahi Pono should implement a Water Management Plan. The Plan should outline improvements to the EMI Aqueduct System, including brush fire prevention and relate water needs to specific crops.</i>
Public control over water delivery systems and watershed areas would support proactive and integrated efforts to ensure an affordable and predictable supply of water.	Board of Water Supply, City and County of Honolulu, 2016 Master Plan, 6.2 Sustain³⁴ The BWS manages thousands of acres of watershed area on O’ahu to protect and preserve 212 separate potable water sources, the combination of 194 individual groundwater wells, 13 active potable water tunnels, and 5 shafts. The BWS’s proactive efforts to manage and protect the watersheds include limiting access and development, combatting invasive animals and plants, promoting healthy forests, and encouraging customer water conservation to reduce the amount of water withdrawn from the environment. These BWS efforts are discussed in more detail in Section 4, Water Supply Sustainability.
Public or quasi-public ownership of the water delivery system would enable the public to ensure that workers are paid a living wage.	Public employees would have to belong to the union.
Public ownership of the EMI water delivery system would provide an opportunity to move towards reparations for the Native Hawaiian families who have not had access to their streams for over 100 years. Unlike local government, which exists to meet the needs of its citizens, a private entity – particularly one that is funded by an institutional investor with obligations to pension fund beneficiaries – will never be able to put environmental and cultural ahead of maximizing revenues.	Per the WUDP: Historically, great efforts were made to allocate water for all needs on Maui. Today, native Hawaiians are challenged with the negative consequences of resource "ownership," with "owners" sometimes lacking sensitivity or requirements to share with others. Perhaps past strategies of sharing distribution and timing of water flows can be adopted in order for all water users to be supplied with this important resource. Consortiums of water partners have been discussed as options to ownership and management of the East Maui Irrigation water system. ³⁵
As noted at the beginning of this document, the impetus for forming the Temporary Investigative Group grew out of the fact that Mahi Pono has not been responsive to the Community, nor has the company responded to requests by the Board of Water Supply for engagement. According to Water Department Director Jeff Pearson, he has continually encouraged Mahi Pono representatives to respond to the Water Board. Even though Director Pearson and the Maui County Administration have lobbied the State Legislature and will	<i>Page 4-141 of the DEIS:</i> <i>It is recommended that interest groups, or stakeholder groups, are clearly defined so that there is recognition of who will be affected by the proposed Water Lease. Groups should include geographic communities, environmental, agriculture and business interests, and public agencies. Each group would be encouraged to reach consensus on their own needs, concerns, opportunities and possible solutions.</i> <i>It is recommended that interest groups are equitably</i>

³³<http://ulupono.com/media/W1siZiIsIjIwMTQvMTEvMTgvMjNmMjhhfNDJfOTQxX0FfU3IzdGVtc19BcHByb2FjaF9mb3JfSW52ZXN0aWdhGluZ19XYXRlci5wZGYiXV0/A%20Systems%20Approach%20for%20Investigating%20Water.pdf?sha=eea0a5f3>

³⁴ <https://boardofwatersupply.com/bws/media/files/water-master-plan-final-2016-10.pdf>

³⁵ Ko’olau WUDP, Page 39

<p>be lobbying the Department of Land and Natural Resources to support EMI/Mahi Pono application for a long-term lease, Mahi Pono has not been compelled to meet with the only volunteer board that advises the Mayor and County Council on matters related to water.</p>	<p><i>represented in a “Core Working Group” that would serve as a forum for exchanging ideas and collaborative efforts, as well as provide feedback and suggestions to Mahi Pono. Each member of the Core Working Group would be expected to reach out to their own networks to extend the discussion beyond the Core Working Group. While there would likely be strong differences in perspectives and opinions, the Core Working Group would need to find ways to establish core principles, common ground and manageable solutions.</i></p> <p><i>The fundamental value that will help bring people to the same table is trust. The Proposed Action has elicited skepticism and distrust over many decades, and these feelings prevent willingness for participating in mediation and collaboration. While developing trust among the various groups will be challenging, the first step is transparency. Being open about intent, plans, and activities can begin to establish credibility and open the door to dialogue.</i></p>
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Risks of leaving access to the public trust in private hands

<p>The County also needs to consider the risks of an outside privately-owned entity that has an obligation for a 10% annual rate of return controlling Maui’s future water supplies.</p>	<p>Any considerations that do not improve the corporation’s bottom line are not likely to be considered unless the corporation were to become a Sustainable Business Corporation under Hawaii State Law or make other commitments in writing.</p>
<p>Lack of water for upcountry if EMI/Mahi Pono don’t get long-term leases.</p>	<p>Page xiii, DEIS: Without the Water Lease, even if EMI could find it economically feasible to continue maintaining the EMI Aqueduct System to divert non-governmental water for diversified agriculture in Central Maui, there may not be enough water to allocate much or any to the MDWS. This lack of water would exacerbate the effects of drought when other surface water sources are unreliable for the KAP and the Nahiku, this could eliminate their primary source of water. Insufficient water delivered to the County through the EMI Aqueduct System could have significant effects on health and safety of those who currently rely on that water delivery.</p>
<p>As climate change creates more uncertainty and extreme impacts on residents, it is dangerous to assume a private company will take responsibility for potential losses (PG&E, bankrupt...)</p>	<p>Page 3-11, DEIS: Climate change may cause a decline in rainfall in Upcountry Maui. Any alternative that may result in less water being delivered through the EMI Aqueduct System to the MDWS for use in the Upcountry Maui Water System could increase periods of intense water shortages in Upcountry Maui.</p>
<p>As noted previously, Mahi Pono and its investor, PSP are required to earn a 10% annual return on their investment. It is not wise to assume that they will put the health and</p>	<p>Associated Press, 2015: “As California enters its fourth year of drought and imposes the first mandatory statewide water cutbacks on cities and towns, the \$6.5</p>

<p>safety of Maui residents before their own profits when they've invested \$260 million. Furthermore, as an entity from out of state with no local ties, there is no social reason for accountability.</p>	<p>billion almond crop is helping drive a sharp debate about water use, agricultural interests and how both affect the state's giant economy."³⁶</p>
<p>In terms of supporting agriculture, it is important to differentiate between export and food security corps; how specific agricultural practices impact the climate crisis; whether the specific economic activity results in good jobs for Maui residents; and or whether it will exacerbate the housing crisis by importing workers.</p>	<p>Because EMI System is currently owned by a company that is required to provide retirement benefits to pension fund beneficiaries, the company cannot consider Maui County food security ahead of export profits, nor can they consider native Hawaiian subsistence farming ahead of domestic or export profits.</p>

In Summary: Determining Costs and Benefits of Purchasing EMI System

- 1) A thorough engineering and cost analysis of the current EMI Delivery system is needed to determine the EMI System’s true value as a stand-alone or partial system (and the various permutations thereof), in conjunction with improvements. This analysis needs to provide reliable information about:
 - What parts of the system are usable and what is the cost and value of repair, particularly in light of the “natural downsizing” currently taking place;
 - Based on the domestic water use needs in Upcountry Maui and the condition of various aspects of the EMI system, what would be the most cost-effective strategy for partial purchase and use of the EMI system?
 - What are the options for condemning parts of the system and/or small tracts of land?
 - What are the benefits, if any, of purchasing specific ditch systems, such as only the Wailua Ditch System?
- 2) Estimates of socio-economic benefits of increased farming in East Maui;
- 3) Estimate of potential cost savings from reduced reliance on Wailoa Ditch if the County had increased access to other diversions on the EMI system;
- 4) Estimate of potential cost savings from improved health, safety, and other socio-economic indicators for East Maui residents who rely on the streams for farming and other cultural and recreational practices.
- 5) Annual costs of maintaining the EMI System.
- 6) Potential revenues based on domestic water and agricultural water sales.

³⁶ <https://www.businessinsider.com/the-65-billion-almond-crop-is-driving-the-sharp-debate-about-california-water-use-2015-4>

V. Alternative Water Sources

Overview of Water Source Planning:

Excerpted from the Maui Island Water Use And Development Plan Draft, Part Iii Regional Plans, Ko`olau Aquifer Sector Area (ASEA)³⁷:

Conventional water sources include groundwater (wells and tunnels) and surface water (stream diversions). Region specific planning objectives related to ground and surface water use and development identified and confirmed in the WUDP update public process include:

- Improving the understanding of the concepts of "precautionary planning" to reduce and adapt to the effects of drought and climate change upon water resource availability and quality
- Adapting future populations to local water resource conditions, integrating conservation and the use of alternative resources
- Water needs of DHHL in the Ko`olau should be considered in general and in accordance with the 2017 State Water Projects Plan

Planning objectives related to groundwater and surface water source use and development identified to apply island wide include:

- Manage water equitably
- Provide for Department of Hawaiian Homelands needs
- Provide for agricultural needs
- Protect cultural resources
- Provide adequate volume of water supply
- Maximize reliability of water service
- Minimize cost of water supply
- Increase water storage capacity with a reserve for drought periods.
- Ensure that adequate water capacity is available for domestic needs of the region.
- Ensure that the development of new water sources does not adversely affect in-stream flows.
- Improve the existing potable water distribution system and develop new potable water sources prior to further expansion of the State Urban District boundary or major subdivision of land in the State Agricultural or Rural Districts.
- Ensure adequate supply of groundwater to residents of the region before water is transported to other regions of the island.

³⁷ Ko`olau WUPD, Page 103

Potable Groundwater Development:

From Ko`olau WUDP:

The amount of groundwater that can be developed is limited by the amount of natural recharge and aquifer outflow that contribute to streamflow and to prevent seawater intrusion, established as sustainable yield. Because delineation of aquifer sectors and systems in some cases are based on limited hydrologic information, areas for potential groundwater development must be assessed on its own merits to determine any additional needs for hydrologic studies and interaction with surface water and other sources.

Understanding potential impact of climate change adds to uncertainty in long-term groundwater availability. The primary responsibility to determine potential impacts on water resource availability lies with the State CWRM who in turn relies on studies and predictions by the scientific community and other agencies. Water purveyors need guidance how to mitigate and adjust to potential changes in groundwater availability.

Other constraints on groundwater availability include access and cost. Conveyance from high yield aquifers in remotely located watersheds to growth areas can be difficult and expensive due to topography and distance. Basal well development at high elevations, such as Makawao aquifer above 1200 feet would result in high pumping costs, just in terms of pumping water from the water table to ground elevation.

Potential effects of groundwater development on streamflow and on the quality of water pumped from existing wells in a region can be evaluated by robust hydrologic studies and models. Joint funding and collaboration between the municipal and private purveyors, CWRM and the U.S. Geological Survey would focus studies to maximize benefits and prevent conflicts in water development and designation. Aquifer systems in Ko`olau are not extensively studied, as indicated by CWRM's confidence rating in establishing sustainable yield. Haiku aquifer has sufficient yield to serve regional demand and support development of planned growth areas outside Ko`olau. It is recommended that CWRM prioritize hydrological studies and groundwater modeling in Haiku and Honopou regions to guide private and public well development and ensure potential impacts on surface water is addressed first.³⁸

Additional points from Central WUDP:

Other constraints on groundwater availability include access and cost. Conveyance from high yield aquifers in remotely located watersheds to growth areas can be difficult and expensive due to topography and distance. The Central ASEA consist of the driest regions on Maui, with annual rainfall generally less than 50 inches. Population centers and growth rely on groundwater

³⁸ Ko`olau WUDP, Page 104

imports from the Wailuku ASEA and the Ko'olau ASEA where rainfall and groundwater recharge are substantially higher. ³⁹

<p>In order to determine whether development of wells in East Maui should be considered as an alternative to surface water, yield, aquifer capacity, and energy cost need to be studied.</p>	<p>Central WUDP, Page 112: Strategy #4 Explore East Maui well development in combination with Makawao aquifer basal groundwater to meet projected demand on the MDWS Upcountry System. Initiate a hydrologic study to determine any negative impact on existing ground and surface water sources, stream flow and influences from dikes. Potential yield is more than the needed 6.3 mgd (potentially in addition to development for the MDWS Central System). Lead agencies would be CWRM and MDWS and hydrologic study to be completed by USGS.</p>
<p>Current inventory of wells in East Maui: The Ko'olau ASEA includes 149 wells, of which 131 are considered "production" wells, the remainder (18) are classified as "unused" (9), observation (2), and seven classified as "other" that do not produce water. The 131 production wells include County municipal (4), private public municipal (3), domestic (59), agricultural (crop use[39]), agricultural (1), agricultural (aquatic plants & animals use [1]), one agricultural (livestock and pasture use), three agricultural (ornamental & nursery plants use), 15 irrigation, and seven irrigation (landscape/water features use).</p> <p>CWRM pumpage reports for 2014 show that pumpage for the Ko'olau ASEA was approximately 0.92 MGD with County Municipal wells accounting for 0.878 MDG (95.81 percent of total sector pumpage), Municipal Private Public wells accounting for 0.015 MDG (1.63 percent of total sector pumpage), Agriculture wells accounting for 0.014 MGD (1.53 percent of total sector pumpage), Domestic wells accounting for 0.008 MGD (0.86 percent of total sector pumpage), and irrigation wells accounting for 0.0017 MGD (0.19 percent of total sector pumpage). However, it is likely that domestic use is underreported.</p>	<p>Page 4-59, DEIS: <i>While no groundwater is transferred from the Ko'olau Aquifer Sector, surface water is conveyed from the sector to the Central Aquifer Sector via the EMI Aqueduct System. Since surface and groundwater interchange depends on the underlying geology, the increase in surface flow since the cessation of sugar cultivation in 2016 also contributes to an increase in groundwater in East Maui.</i></p> <p>Page 3-9, DEIS: <i>There may be a connection between decreased stream diversions and increased groundwater. However, the current pumpage of wells in the four aquifers in East Maui (Ha'iku, Honopou, Waikamoi, and Ke'anae of the Ko'olau Aquifer Sector) is well below the SY (Sustainable Yield.)</i></p> <p>Page viii DEIS: naturally running low during seasonally dry weather conditions. Hence, the amount of water that can be diverted during dry weather conditions would be substantially less than when sugar was being cultivated. As a result, dependence on groundwater resources during such conditions may increase and/or water conservation measures may be required. Future climate change could also exacerbate the frequency and length of periods of low rainfall.</p>

³⁹ Central WUPD, Page 105

<p>Cost of well development and operation: Wells are more expensive than surface water due to energy costs for development and pumping, but costs can be mitigated with solar, wind, hydro-pumped storage, particularly if the Department has access to land.</p> <p>In order to comprehensively compare costs, all factors described previously in this report related to repair and maintenance of the EMI Aqueduct System, combined with the environmental, safety and cultural benefits of EMI ownership would need to be compared to well development costs.</p> <p>Any well development plan should include scenarios that utilize renewable energy, the costs of the development of which would also need to be calculated. However, agreements with MECO and the benefits of bringing the State to its goal of 100% renewable energy by 2045 would also need to be factored in.</p> <p>Page 110 WUDP: Explore new basal well development in the Makawao aquifer to accommodate growth Upcountry and add reliable new source. Potential yield is up to 3 mgd. Lead agency is MDWS, DLNR and/or public/private partnerships.</p>	<p>Page 3-2 to 3-3, DEIS: “a single well is normally allowed to pump about 1 mgd within its area”</p> <p>Given current figures regarding Kamole Treatment Plant needs, 3 to 7 wells would need to be developed. Each well site would have an estimated development cost of \$6 million. (Akinaka, 2019).</p> <p>The cost of planning, obtaining permits for, and constructing 7 wells would be approximately \$13 million. Added to this cost would be transmission pipes, additional pumping and related energy consumption to reach higher elevations, and reservoirs.</p> <p>Page 110, WUDP: The 2013 MDWS study estimated well development at 2,050 foot elevation and related booster pump and transmission line to about \$8.4M and a 20-year cost of \$2.90 per 1,000 gallons for development of 1.2 mgd pump capacity, normally run at 0.8 mgd source capacity. The study only evaluated a scenario with one well in Makawao aquifer and in combination with well development outside Makawao aquifer.</p>
<p>Central WUDP, Page 109: Adding 20% to projected 2035 demand of 8.53 mgd for Upcountry is 10.23 mgd. With the addition of the Priority List demand of 7.3 mgd, total demand is 17.54 mgd. Available source capacity is 11.2 mgd, which would require the balance 6.34 mgd to be developed. (includes 7.0 Surface Water)</p> <p>8.53 mgd 2035 Municipal Demand + Peak Factor 20% = 10.23 mgd + Upcountry Meter Priority List 7.3 mgd = 17.54 mgd</p> <p>- 11.2 mgd Available Source Capacity = 6.34 mgd Source Needed</p>	<p>Page 3-17: DEIS:</p> <p>If the MDWS has to replace the 7.1 mgd supplied by the EMI Aqueduct System, and in addition develop to the 7.95 mgd projected to be needed to meet future water demands, the MDWS would need to develop 15.05 mgd of new water source. It is estimated that the life-cycle unit cost to develop those necessary wells and reservoirs for Upcountry Maui is \$38 per kgal. This would translate to \$2.6 billion, compared to \$1.2 billion under the Proposed Action.</p>

Other Sources of Potable and Non-Potable Water

Other Water consumption varies seasonally, with the low demand months generally reflecting lower outdoor irrigation demands. For MDWS systems, the seasonal fluctuations indicate the potential for outdoor water conservation as well as ways to offset use of potable water for non-potable needs. These conditions are likely to also apply to all public water systems that serve community needs.

Reservoirs: Are there studies showing current reservoir capacity and optimum inventory for an efficiently integrated storage system?	What is a private owner's obligation to the public with regard to maintaining storage for health and safety reasons?
<p>Central WUDP, Page 123: In summary, reservoir and treatment plant expansion would have multiple benefits:</p> <ol style="list-style-type: none"> 1. Improve reliable capacity 2. Economical water supply that minimized expensive groundwater pumping costs 3. Defer source development in Haiku aquifer in light of uncertainties related to the East Maui Consent Decree 4. Recharge regional groundwater in wet season when maximizing use of stormflow from rainfall <p>If financing can be secured, raw water storage construction presents an economic strategy compared to basal well development. If a string of basal wells and extensive transmission would be added to the MDWS Upcountry System during the same time frame as a reservoir, the economic benefit would be significantly diminished. Both resource strategies have long implementation time frames and can be adjusted over time. Should development of basal source in the Makawao aquifer produce adequate yield and quality, additional wells in Haiku aquifer OR expanded surface water storage and treatment will meet projected demand. Uncertainties in future stream flow must be weighed against increased reliability and cost of basal well development. Maximizing affordable surface water use in wet season must be weighed against "over building" expensive wells and infrastructure that is not used to capacity.</p> <p>On Oahu, the BWS also operates brackish and recycled water nonpotable water systems for irrigation and industrial use in 'Ewa, Mākaha, and Hālawa Airport. The BWS owns and maintains five dams or open reservoirs. Four reservoirs in Nu'uaniu are now used solely for flood control, and the fifth, Mauna 'Olu reservoir, stores nonpotable water used for irrigation. The four Nu'uaniu reservoirs may be used for stormwater capture, infiltration, or hydropower in the future.⁴⁰</p>	<p>Central WUDP, Page 124: Strategy #8: Pursue hydrologic studies needed to explore the Haiku aquifer and an updated ditch flow analysis to optimize raw water storage and treatment plant capacity at Kamole Weir in order to expedite the most feasible new source. Raw water storage and Kamole Water Treatment Facility expansion are contingent on a long term agreement with A&B Properties allocating adequate surface water for the MDWS Upcountry System. Lead agency is MDWS.</p> <p>This strategy supports multiple planning objectives, including to seek expanded municipal withdrawal from the lowest cost source to serve the Upcountry region and to increase water storage capacity with a reserve for drought periods.</p> <p>Central WUDP, Page 104, <i>Water Loss Mitigation:</i> Explore funding and conduct a cost benefit analysis of improvements to the EMI non potable conveyance system to mitigate losses and preserve existing reservoirs at risk of decommissioning. County of Maui and A&B Properties/EMI Company in partnership would lead initiatives. Priority components and associated costs TBD.</p> <p>Page 3-4, <i>DEIS:</i> EMI Aqueduct System has eight reservoirs, mostly along the lower ditch systems, and the Central Maui field irrigation system has 48 major reservoirs. The combined storage capacity of these existing reservoirs is approximately 1,344 mg (Akinaka, 2019). Most of these reservoirs, however, have not been used since the closure of sugar in 2016 and others have not been used because they do not meet dam safety requirements. As a result, many will require extensive upgrades to put them back into service. These upgrades could cost between \$50 – 100 million (Akinaka, 2019). Obtaining permits to upgrade and repair these reservoirs will also be challenging due to current dam safety requirements. Assuming that the existing reservoirs can be restored to their full capacity of 1,344 mg, and the amount of flow available for irrigation under the Proposed Action is approximately 92.32 mgd, then the existing reservoirs could provide about 16 days of storage</p>

<p>Recycled Water</p> <p>The State of Hawai'i defines R-1 water as the highest-quality recycled water; it has undergone filtration and disinfection to make it safe for use on lawns, golf courses, parks, and other areas used by people. R-2 recycled water can only be used under restricted circumstances where human contact is minimized.</p>	<p>Central WUDP, Page 57: Wastewater generated within the Central ASEA is treated at the Kahului Wastewater Reclamation Facility (WWRF), east of Kahului Harbor, and the Kihei WWRF. No wastewater serves East Maui or Upcountry?</p>
<p>Rainwater Catchment:</p> <p>WUDP: Rainwater catchment is the collection of rainwater from a roof or other surface before it reaches the ground.</p> <p>Rainwater catchment systems are not regulated by the Department of Health, making estimates of their use difficult. No inventory of installed catchment systems throughout the island is available.</p> <p>Central WUDP, Page 129: Rain barrel incentive programs are included in recommended demand side conservation strategies and the MDWS conservation program.</p> <p>Catchment systems for agricultural uses have historically played an important role Upcountry. Support for increased adaptation to natural ambient rainfall and climate adapted crops is consistent with the objective to use appropriate water quality for appropriate uses.</p>	<p>Koolau WUDP, East Maui: On average, USGS data indicates rainfall ranges from 101-454 inches per year, making the Ko'olau ASEA Maui Island's rainiest ASEAs and one of the wettest places in Hawai'i. The heaviest rainfall is in the Ke'anae ASYA, where it rains as much as 454 inches per year. The cooler, dryer upper elevations may have as little as 101 inches of rain per year. Rainwater catchment is not as reliable a conventional water resource because it is extremely sensitive to the climate; however, rainwater catchment is a viable option in this region.</p> <p>Central WUPD, Upcountry and Central, Page 56: Rainfall averages 15 inches along the southern coastline on Haleakala, and it increases to 70 inches as one moves eastward and into higher elevations. Rainfall catchment systems occur in the eastern part of the hydrologic unit, from Makawao and Olinda and also scattered throughout Kula. There is no official inventory of catchment systems but it is an important supplemental resource for non-potable purposes. Catchments systems using potable treatment technologies have been installed Upcountry due to water meter limitations imposed by the Upcountry Meter Priority List.</p>
<p>Stormwater reuse:</p> <p>The Fresh Water Council believes that a critical element of protecting long-term water security in the Hawaiian Islands is to aggressively increase our ability to capture rainfall and surface storm water. Our underground fresh water supply can be restored with: 1) reduced pumping from the aquifers; 2) increased rainfall; and/or, 3) increased effective recharge. ⁴¹</p> <p>Central WUPD, Page 129: Stormwater capture and use can provide multiple mitigating effects on</p>	<p>There is no reported stormwater reuse within the Ko'olau ASEA, although a limited number of development projects may have stormwater controls incorporated into project design to reduce runoff and its effects.</p> <p>Stormwater reuse at the parcel scale may also provide an opportunity to offset landscape and other irrigation demand of projects or households.</p> <p>Central WUPD: There is no reported stormwater reuse in the Central ASEA, although some</p>

⁴¹ Fresh Water Council, Page 13

<p>climate change, including off-setting potable supply for irrigation needs; recharging low level and more brackish portions of the region’s aquifers; and mitigating sediment runoff reaching the nearshore marine environment and reefs.</p> <p>Central WUDP, Page 58: Capture and reuse of stormwater runoff is an under-utilized water resource that provides an opportunity to reduce reliance on groundwater and surface water for landscape irrigation, especially when incorporated into the design of development projects in order to minimize infrastructure costs.</p>	<p>development projects may have stormwater controls incorporated into project design to reduce runoff and its effects. The <i>Hawai’i Stormwater Reclamation Appraisal Report, 2005, and Study Element 3: An Appraisal of Stormwater Reclamation and Reuse Opportunities in Hawai’i</i>, September 2008, screened and identified four projects on Maui within the final ranking, which might provide opportunities to augment agricultural irrigation water that is diverted currently from Maui streams, in addition to providing other benefits:</p>
<p>Desalination:</p> <p>Desalination of ocean or brackish water was studied as an option in the 2013 MDWS study, Maui Island Water Source Development Options for the Central MDWS system, but an assessment has not been conducted for the Ko’olau ASEA, and there are presently no desalination projects within. There are no desalination projects in the Central ASEA.</p>	<p>One major cost to operate a desalination plant is the high energy demand of the process, and the disposal of the brine liquid byproduct creates logistical and environmental challenges that also increase cost. As desalination technology advances and energy costs decrease, brackish and ocean water desalination should continue to be evaluated for their potential as effective future water supply alternatives.</p>

VI. Ensuring Access to the Public Trust:

<p>While ownership of parts or the full EMI Delivery System, as well as ownership of land parcels are obvious avenues for ensuring access to the public trust, other remedies should also be explored.</p>	<p>What are the legal actions that can be taken besides condemnation?</p>
<p>Negotiate new Domestic water use Agreements with EMI/Mahi Pono:</p> <p>As noted in the DEIS, “EMI agreements with the MDWS provide that water supplied to the MDWS is contingent upon the Water Lease being issued...Currently the MDWS is being charged 6¢ per 1,000 gallons to receive East Maui surface water for the KAP and other Upcountry Maui farm areas.”</p> <p>In the past, EMI was required to maintain the roads and trails, maintain the delivery system, and leave enough water in streams for downstream domestic</p>	<p>One key way to safeguard the public is to negotiate new agreements with EMI/Mahi Pono that:</p> <ol style="list-style-type: none"> 1) Remove contingency of access to the public trust on a private company receiving permits/leases from BLNR. 2) Require a minimum level of repair and maintenance of the Ditch System by EMI/Mahi Pono to ensure the health and safety of the community. 3) Require that EMI/Mahi Pono reduce leakages in the delivery system to optimize water use, thereby

<p>water users and Kuleana users, and they were required to post a \$100,000 performance bond.⁴²</p>	<p>increasing amount of water going to the Kamole Treatment Plant, and decrease the amount of water diverted from streams.</p> <p>4) Require a minimum investment in the care of the watershed and other environmental responsibilities, that includes partnerships with stakeholders.</p> <p>Can the county require water conservation from an environmental perspective – for example a kind of carbon tax – wasted water tax?</p>
<p>State Irrigation System</p>	<p>WUPD (Central)⁴³ A non-potable State water system exists within the Polipoli State Recreation area. The Polipoli Springs State Recreation Area water system is located in the Kahikinui Forest Reserve, overlying the Kama`ole Aquifer. The water system is owned and operated by the State of Hawai`i and managed by the DLNR-State Parks. The water system serves a park cabin and campground area. The non-potable source for the water system is an unnamed spring. The spring water flows through a 1-1/2-inch pipe to the campground area. The estimated water demand is 0.002 mgd. Information to determine the stream diversion capacity is not available and flow measurements are not recorded. System source capacity adequacy could not be determined. Future water demands for the park are unknown.</p>
<p>Ownership can take multiple forms. Parts or all of the EMI Water Delivery System:</p> <ul style="list-style-type: none"> • Can be owned and operated by the County of Maui, regulated by the PUC. • Can be owned and operated by a Maui Water Authority (A Quasi-public organization) that would protect, regulate and develop future water systems for Maui County holding to the concept that water is a public trust with Hawaiian water rights having priority over all other end users of this public commodity. The PUC would regulate the rates to charge private and commercial consumers and the County of Maui. • Can be owned by a public-private partnership, similar to above, possibly incorporated as a Public Benefit Corporation (in order to explicitly commit to serving the public good), and regulated by the PUC. • Can be owned and operated by a co-operative. 	<p>Page 4-140, DEIS: <i>Another theme, expressed primarily in the Kula / Pukalani focus group, was that water is a public trust, and should not be controlled by a single private corporation. They suggested a restructuring of public utilities to include a water utility that would be administered similar to the current electricity in the public utility structure. Further, profit made from use of this public trust should be invested in public need.</i></p>
<p>Purchase of parts or all of the EMI Water Delivery System and systems that connect to Kamole Weir</p>	
<p>Purchase of the EMI Water Delivery System and</p>	

⁴² Land Lease Bearing, General Lease #3578, 1959, Pages 3,4, 15,16

⁴³ Central, P. 49

Mahi Pono Lands:

Access to Mahi Pono land would allow the County or "Maui Water Authority" to implement a comprehensive Water Management Plan that includes care of the watersheds, comprehensive support for East Maui practices, renewable energy options, supporting proactive and integrated efforts to ensure an affordable and predictable supply of water combined with flexibility with regard to revenue generation that is not dependent on water consumers.