

Testimony of
Darren Unemori, P.E., P.L.S.
Warren S. Unemori Engineering, Inc.
SLUC Docket No. A10-787 Maui R&T Partners, LLC.

In the Matter of the Petition of Maui R&T Partners, LLC. to Amend the State Land Use District Boundary of Lands Situated at Kihei, Island of Maui, State of Hawaii, Consisting of 253.05 Acres from the Agricultural District to the Urban District,
Tax Map Key Nos. (2) 2-2-024: 016 and 017, and (2) 2-2-002: 054 (por.)

My name is Darren Unemori and I am a Licensed Professional Civil Engineer and Vice President of Warren S. Unemori Engineering. I prepared the *Preliminary Engineering Report for the Maui Research and Technology Park Master Plan Update* (Revised February 2013) (included as Appendix F in the Final Environmental Impact Statement). I have been directly involved in the management of engineering projects in Hawaii since 1988 and have been a Supervising Civil Engineer at Warren S. Unemori Engineering, Inc. since 1994. A copy of my resume is attached.

The Preliminary Engineering Report describes the existing infrastructure in the vicinity of the Maui Research and Technology Park and identifies the key improvements that will be needed to develop the MRTP as proposed in its updated Master Plan. I will briefly summarize the main discussion and findings of the Water System, Wastewater System, and Drainage sections of the report.

Water System

The Maui Research and Technology Park (MRTP) is located within Maui County Department of Water Supply's Central Maui Water System service area. Potable Drinking water for the 18 existing lots within the MRTP currently comes from existing wells located in upper Waiehu and North Waihee which draw groundwater from the Iao and Waihee Aquifers. The existing irrigation systems for the landscaped common areas and developed parcels in the MRTP now utilize R-1 quality effluent from the Kihei Wastewater Reclamation Facility (KWWRF) by drawing it from the existing County 10-inch R-1 waterline which runs along the easterly (mauka) boundary of the MRTP.

Drinking and non-drinking water demand projections were based on land area and unit estimates using consumption rates adopted from the Maui County Department of Water Supply's *Water System Standards*.¹ A 60% potable/40% non-potable demand ratio – the ratio recommended by the Honolulu Board of Water Supply for dual systems² -- was also selectively

¹ County of Maui, Department of Water Supply, *Water System Standards*, 2002, Table 100-18: "Domestic Consumption Guidelines," p.111-3.

² See Appendix B-1 of the Preliminary Engineering and Drainage Report in Appendix F.

applied in certain instances to break total demand down into drinking and non-drinking water demand components.³ Total average daily water demand for the MRTP expansion not supplied by DWS is 1.17 million gallons per day (MGD). Average daily demand for both phases for drinking water and non-drinking water is 798,065 gallons per day (GPD) and 373,329 GPD, respectively.

The County of Maui Dept. of Water Supply-operated public water system remains the preferred source of water for expansion of the Maui Research and Technology Park. Unfortunately, because the Maui County Dept. of Water Supply has indicated that they cannot commit to providing drinking water beyond the existing 18 lots within the MRTP, MRTP has proposed an alternate, privately owned and maintained drinking water source and distribution system to support further expansion. Two alternate sources of water for the project were identified. These alternate systems would all be privately operated and separate from the existing DWS water system currently serving the 18 existing parcels in the MRTP.

Source Alternative 1 includes five offsite brackish wells located at the 580-foot elevation on land currently owned by Haleakala Ranch Company. Offsite improvements associated with this alternative will include a 0.25 million gallon (MG) brackish water head tank located at the 590-foot elevation, a 12-inch transmission waterline to a Reverse Osmosis (RO) treatment plant using a high pressure filtration process to produce potable drinking water, two disposal wells to discharge the concentrate (wastewater) generated by the RO process, potable water storage tanks at the 375 foot elevation, and a 16-inch distribution waterline connecting the storage tanks to the MRTP's potable water distribution system.

Source Alternative 2 consists of five (5) onsite brackish wells located along the easterly portion of the MRTP. A 0.25 MG brackish water head tank and RO treatment plant with two disposal wells to discharge the concentrate from the RO treatment plant would be located within the MRTP. The RO product water would be pumped from the RO treatment facility into drinking water storage tanks also located within the MRTP at the 212-foot elevation. The Applicant will continue to coordinate with the Department of Water Supply and is willing to discuss alternatives to private water system development using the Kamaole Aquifer.

MRTP will continue to utilize R-1 quality effluent from the KWWRF as its primary source of non- drinking water to supply its landscape irrigation demand. During periods where the R-1 supply may not be sufficient to accommodate the landscape irrigation needs for the entire MRTP, untreated brackish groundwater will be used.

Wastewater System

The existing lots in the Maui Research and Technology Park (MRTP) are served by a privately owned and maintained wastewater system which collects and conveys their wastewater to the

³ See Appendix B-2 of the Preliminary Engineering and Drainage Report in Appendix F.

KWWRF for processing. Wastewater flow projections for the MRTP were developed using land use, land area and unit count data multiplied by corresponding demand rates adopted from the Maui County Wastewater Reclamation Division.⁴ The MRTP expansion is estimated to generate an average daily wastewater flow of 0.5 MGD. Wastewater improvements needed for the expansion of MRTP will consist of new gravity sewer mains located primarily within planned roadways to collect wastewater from the developed lots and convey it a new or existing sewer pump station that will then convey the wastewater by force main to the KWWRF for treatment. The expanded wastewater system will be connected to the existing MRTP system and continue to be privately owned and maintained.

Incremental improvements to increase the capacity of the existing MRTP wastewater pumping system will be required to accommodate the larger design peak wastewater flows generated by development Phases 1 and 2 as they are built out. Capacity improvements and modifications to the existing force main connection at the headworks of the KWWRF may also be required by the County of Maui to accommodate the increased wastewater flow into the facility. Treatment capacity at the KWWRF is expected to remain sufficient to accommodate development of the MRTP over time.

Drainage

The 411 acre MRTP project area is flanked by two major drainageways: Waipuilani Gulch to the north, and Keokea Gulch to the south. Storm runoff from the undeveloped lands mauka (east) of the project site flows across the MRTP project area in an east-to-west direction. Runoff leaving the MRTP project area continues westward, flowing across the Elleair Golf Course to Piilani Highway, where existing culverts pass the runoff under the highway. Surface runoff from the undeveloped project site drains in a westward direction, flowing into one of the minor drainageways crossing the MRTP and commingling with the offsite-generated storm runoff before exiting the MRTP project area toward the Elleair Golf Course. Total peak pre-development onsite runoff, based on a 50-year recurrence interval, 1-hour duration storm is 379 cubic feet per second (cfs).

Offsite runoff will be allowed to pass through the MRTP project site and continue to drain across the Elleair Golf Course and toward the existing culvert crossings at Piilani Highway without further mitigation as permitted under Maui County Drainage Rules.⁵ Development is expected to increase the peak flow rate of runoff generated by the MRTP project area. Peak post-development onsite runoff, based on a 50-year recurrence interval, 1-hour duration storm is estimated to be 904 cfs, an increase of 525 cfs from pre-development onsite runoff.

⁴ Maui County Dept. of Environmental Management, Wastewater Reclamation Division, "Wastewater Flow Standards," February 2, 2000.

⁵ County of Maui, Department of Public Works and Waste Management, "Rules for the Design of Storm Drainage Facilities in the County of Maui," Title MC-15, Chapter 4, November 2, 1995, Section 15-04-06(14).

Storm runoff generated within the MRTP will typically be intercepted by drain inlets located along roadways and in building site parking lots, then conveyed by underground drainline to a stormwater detention facility which will reduce the peak discharge rate to pre-development levels before the runoff is allowed to continue downstream. Drainage detention basins designed to mitigate the peak runoff from roadways and residential areas will be distributed among the internal drainage areas within the MRTP; these basins will be sized to a 50-year recurrence interval, 1-hour duration storm in conformance with Maui County Drainage Rules.⁶ Each commercial and institutional lot will be required to mitigate its own increase in peak runoff due to development and limited to a downstream stormwater discharge whose peak rate is no greater than its pre-development level. Drainage Reserve Areas have been incorporated into the MRTP Master Plan to accommodate the safe passage of offsite storm runoff through the MRTP project area. The alignment of drainage channels which convey storm runoff through these Reserve Areas will generally follow the natural flow path of the existing drainageways as they cross the project site. The MRTP stormwater management plan emphasizes the use of vegetated surface drainage facilities to treat and infiltrate stormwater in order to control water pollution, reduce peak flows and runoff volumes, and promote groundwater recharge. Roadway and parking lot drainage systems will be designed to infiltrate pavement-generated stormwater onsite to the maximum extent feasible⁷ before discharging flows into the underground storm drain system. Pavement runoff will be passed through vegetated drainage facilities located in medians, bulb-outs, curb extensions, tree planters, and landscape strips to the greatest practical extent before entering the underground storm drain system.

Power and Communication

Maui Electric Company's (MECO) Maalaea Power Plant serves the Kihei-Wailea region from the Kihei and Wailea Substations. The Kihei Substation serves the MRTP area. When fully built out, the electrical demand for the Master Plan update is forecast to be 23,750 kilowatts. Based on the anticipated demand, MECO anticipates a new substation be required in the first page of the project—along with associated electrical infrastructure, equipment and related easements.

Current plans for the project include adequate land for locating a new substation. Additionally, the project proposes to underground existing overhead power lines that run north south along the mauka boundary of the southern portion of the project. These lines will be placed underground as the project is built out from the existing employment core towards the south. The developer will coordinate closely with MECO to ensure adequate service is provided.

Currently, Hawaiian Telcom, Time Warner Telecommunications, and Wavecom Solutions have

⁶ County of Maui, Department of Public Works and Waste Management, "Rules for the Design of Storm Drainage Facilities in the County of Maui," Title MC-15, Chapter 4, November 2, 1995, Section 15-04 05(e).

⁷ Infiltration will be most effective in areas where well drained soils are present.

underground systems in place at MRTP, but additional underground infrastructure may need to be installed to accommodate the proposed residential and commercial addition. Sandwich Isles Communications is currently sharing conduit and other infrastructure with another provider, but is planning to have a separate dedicated system in MRTP in the future.

Oceanic Time Warner Cable has one node servicing all of the residential lots in the area and another node servicing all the commercial lots. They feel that everything that is being proposed to be built on this project can be serviced with current nodes, which should be adequate for a while. However, in the event that additional nodes are needed, Oceanic Time Warner Cable will initiate their installations.

DARREN UNEMORI, P.E., P.L.S.

Vice President; Supervising Civil Engineer and Land Surveyor, Warren S. Unemori Engineering, Inc.

SUMMARY OF QUALIFICATIONS

Darren Unemori has been involved in infrastructure planning and design on a wide range of large-scale land development projects in Maui County. He has worked as W. S. Unemori Engineering's supervising civil engineer for the 1100 acre Villages of Leiali'i Master Planned Community in Lahaina, Maui; the 549-acre Kehalani Master Planned Community in Wailuku, Maui; the 985-acre Maui Lani Project District in Kahului, Maui; the 100-acre Maunaloa Village redevelopment project on Molokai; and the 450-acre Wailuku Country Estates agricultural subdivision in Wailuku, Maui.

EDUCATION

BSCE - University of California at Berkeley, 1987

Master of Engineering, CE - University of California at Berkeley, 1992

PROFESSIONAL REGISTRATIONS

Civil Engineer; State of Hawaii; No. 7937-C

Land Surveyor; State of Hawaii; No. 10008

Land Court Surveyor; State of Hawaii; No. 308

PROFESSIONAL AFFILIATIONS

Hawaii Society of Professional Engineers (Member)

National Society of Professional Engineers (Member)

American Society of Civil Engineers (Member)

PROFESSIONAL EXPERIENCE

Maui Lani Project District, Wailuku and Kahului, Maui, Hawaii

Civil engineer and land surveyor for this 985 acre, mixed-use urban master planned development in the Wailuku-Kahului area. Commercial projects have included the Maui Lani Village Center, Maui Lani Shopping Center, and Maui Lani Medical Center; residential projects have included the Islands and Bluffs, Sandhills Estates, Fairways, Na Hoku, Legends, Parkways and Traditions single-family subdivisions. Major infrastructure projects have included Maui Lani Parkway, Kuikahi Drive, Kamehameha Avenue and Onehee Avenue roadway extensions, along with the backbone potable water, sewer and drainage infrastructure for the Maui Lani Project District. The development of the Maui Lani Project District is still ongoing.

Kehalani Project District, Wailuku, Maui, Hawaii

Civil engineer and land surveyor for this 549 acre, mixed-use urban master planned development. Residential projects have included Halemanu, Nanea and Olena single-family subdivisions; major infrastructure work has included development of the Kehalani Drainage Master Plan and design of offsite drainage improvements. The development of the Kehalani Project District is still ongoing.

Wailuku Country Estates, Wailuku, Maui, Hawaii

Civil engineer and land surveyor responsible for land planning, subdivision mapping, and design of roadway, water and sewer improvements for this 450 acre, 184-lot agricultural subdivision where very little public infrastructure originally existed. This project was completed in 2005.