MINUTES
FOR THE MEETING OF THE
COMMISSION ON WATER RESOURCE MANAGEMENT

DATE: **May 25, 2010**
TIME: **1:00 pm**
PLACE: **Paia Community Center**
Hana Highway
Paia, Maui

Chair Laura Thielen called the meeting of the Commission on Water Resource Management to order at 1:12 p.m.

The following were in attendance and/or excused:

MEMBERS: Ms. Laura Thielen, Dr. Chiyome Fukino Dr. Lawrence Miike, Mr. Neal Fujiwara, Ms. Donna Kiyosaki, Mr. William Balfour, Jr.

STAFF: Ken Kawahara, Roy Hardy, Dean Uyeno, Chui Ling Cheng

EXCUSED: Mr. Sumner Erdman

COUNSEL: Linda Chow, Esq.

OTHERS: Melit P. Medeiros; Alexandria R. Crisologo; Pauline Cachela, Tinidad Yadao; Trinidad Galapia; Aireliane Iaconsay; Josephine Baggao; Silvestre Baggao; Meby Damaran; Josefina Ngayan; Rosalinda O. Aganon; Valerio Pagador; Ignacio Corpuz; Aguifina Ibarra; Guiereo Rasay; Nestor Sorfrida; Noli R. Santos; Fredelito Pacadio; Geoff Haines; Koa Martin (HC&S); Matthew Kauhola Jr. (HC&S); Doug Kaleikini (HC&S); Gary F. Rodrigues (HC&S); Guy Kiane Jr. (HC&S); Julian Arlanger (HC&S); Douglas Cheehan (Kaman Ind. Tech.); Loreto Cabalse (HC&S); Burt Sato (HC&S); Jofrey Racardio (HC&S); Arnel Galo (HC&S); Mitchell MacCluer (CPS); Joseph Pascua; Wilmer Falix (HC&S); Justin Quenga (HC&S); Mario Olivera (HC&S); Alika Corpuz (HC&S) Mike Fernandez (HC&S); Canny Piller (HC&S); John Ravan (HC&S); Sernoma L. Nerona (HC&S); Orfelia Sagario (HC&S); Amgelita Vaspquer (HC&S); Glenda Ramiscal (HC&S); Laura Alfonso (Maui Petroleum); Carol Reimann (MHLA); Estelita Agoot (HCGS); Luzuimenda A. Agonay (HC&S); Felisa Eastaquio (HC&S); Laurenana Galapia (HC&S); Leonida Albano (HC&S); Susan Tumacoler (HC&S); Presentacion Castillo (HC&S); Elina Asunicion (HC&S); Mildred Pascua (HC&S); Alicia Ulep (HC&S); Juanito Mancesad (HC&S); Teresita M. Natividad (HC&S); Fracudes Gager (HC&S); Santos Rumbaoa (HC&S); Rogeuo O. Agubo (HC&S); Melony Norozian (HC&S); Corason Badua (HC&S); Keith Watimar (HC&S); Ruben Gallur (HC&S); Fanzel ? (HC&S); Thomas Pasqual (HC&S); Emesto Ibarioa (HC&S); Calixto A. Agustin (HC&S); Alejandro Sagario (HC&S); Juanito Basuel (HC&S); Harold Galindo (HC&S); Michael Ross (HC&S);

Reymi Mata (HC&S); Leo Ramos (HC&S); Entiano Aguiran (HC&S); Pauline Ramitson (HC&S); Diane Bevilacorea; Jowel Ibarra (HC&S); Jupiter Espiritu (HC&S); Alvaro Castillo (HC&S); Juanina P. Agtagma (HC&S); Virgilio Rasos (HC&S); Rengoes Calep (HC&S); Rengoes Calep (HC&S); Dominador Gainbarce (HC&S); Romelo Pajotpotar (HC&S); Manny Adrliapa (HC&S); Jason Mogilefsky (HC&S); David Hauan (United Auto Parts); John M. Ponce Jr. (HC&S); Deith O. Pocock (HC&S); Dan Ligienza (HC&S); Nestor Hugo (HC&S); Jamie Shishida (J. Shishida farm); Michelle Goruen (HC&S); Lloyd Taguchi (HC&S); Calisto Dalos (HC&S); Kathy Moreis (HC&S); Ray Nakyama (HC&S); Lynn Takakuma (HC&S); Clarence Moniz (HC&S); Wilbert Rodrigues Jr. (HC&S); Benny Cordero (HC&S); Michael Lurandy (HC&S); Randy Garinday (HC&S); Dorothy Agoujbay (HC&S); Michael Prais (HC&S); Lambert Albert (HC&S); Benvie Agpaoa (HC&S); Benjamin Garcia (HC&S); Michael Paifagao (HC&S); Marcolino Corpuz (HC&S); Noly Corpuz (HC&S); Navam Hayes (HC&S); Expedito Castillo (HC&S); Roger Ageran (HC&S); Pedrito Mendoza (HC&S); Jaime Aleida (HC&S); Salvador A. Visay (HC&S); Eldred Ligonid (HC&S) Macario Pacubas (HC&S); Helario Pasaba (HC&S); Martin Padres (HC&S); Benito Corpuz (HC&S); Richard Cobbat (HC&S); Marvin Murao (HC&S); Adrian Yadao (HC&S); Jason Pachico (HC&S); Carig Rsamussen (Paradise Flower Farms); Bozay Ito (MOGA); D. Samli (HC&S); Randy Rig (HC&S); Roger Roceteo (HC&S); Roberto Guifasan (HC&S); F. Sajun (HC&S); Jeffrey Fernandez (HC&S); Orlina Juag (HC&S); Thunne Biffry (HC&S); Melicio Agran (HC&S); Steve Onaga (HC&S); Grey Hoyd (BEI-Hawaii); Leigh Fukugomi (HC&S); Fred Kekua (HC&S); Mack Adam (HC&S); Esterand Fennani (HC&S); Gregorio Baoit; arsenio Crisologo (HC&S); Domingo Paet (HC&S); Simeon Valdez (HC&S); Ely Nativdad (HC&S); Jeff Olivar (HC&S); Ray-An Olivar (HC&S); Raly Y- (HC&S); Joseph L. Capolay (HC&S); Rodrigo Ragtong (HC&S); Fed Santiago (HC&S); Benito Timbaxza (HC&S); Geofry Fernandez (HC&S); Handy Zanuertia (HC&S); Jun Jun R. Vivit (HC&S); Pamelo Tumpap (Maui Chamber of Commerce); Donald F. Santos (HC&S); Rodney Chiu (HC&S); Levy Silva (HC&S); William Sardinba Jr. (HC&S); Mark Bent (HC&S); Wesley Bissen (HC&S); Alex Davis (HC&S); Florenitcio Cabrerap (HC&S); Alvin Honokauper (HC&S); Gary Yamashita (HC&S); Lance Rodrigues (HC&S); Andre Abad (HC&S); alfredo Agtagma (HC&S) Anpin Ago (HC&S); Elmo Manuel (HC&S); Eddie Amboya (HC&S); Reuben Macinnag (HC&S); Dionicio Baruela (HC&S); Jeff Williams (HC&S); Robinson Berbano (HC&S); Alberto M. Taedol (HC&S); Lazaro Ulep (HC&S); Tanis Biga (HC&S); Ireneo Gorbero (HC&S); Esther Beffry (HC&S); Lucia Sanchez (HC&S); Flordeliza Aquino (HC&S); Betty Ramsay

(HC&S); Gloria Rosal (HC&S); Avelina Bulosoas (HC&S); Manuel Corpuz (HC&S); Pablo D. Bumangag (HC&S); Alice L. Lee; Filomena Valdez (HC&S); Nicanor E. Casumpang Jr. (HC&S); Maria U. Bumanglag (ILWU); Joseph E. Puesalud (Hawthorne Pacific Corp.); Sidy Vilora (HC&S); Sheldon R. Bega (HC&S); Sean Loa (American Machinery); Eileen Carrahuo (HC&S); Gen Caluty (HC&S); Caloin Keau (D&M Hydrualic); William Kennison (ILWU); Johnny Arisumi; Stephen West (ILWU); Harold J. Jacintho (HC&S); Winona Nunes (ILWU); Alisanter Welter (HC&S); Filipinas Corpuz (ILWU); Warren Watanabe (MLEB); JoAnn Balone (ILWU); Harry Evanson; Ruby Yoshisato (ILWU); Ruden Ramanor (HC&S); Maria C. Prieto (ILWU); Dolores P. Garcia (ILWU); Caygteina Paet (ILWU); Louise Corpuz (ILWU); Florence Zabbal (ILWU); Ben Greangel (ILWU), Margo Amt (ILWU); Raymond Zogah (ILWU); Aljon Echalas; Domingo Rodil (ILWU); G. Bautiem (ILWU); Roberta Dumlao (ILWU); Ian Cabatingan (HC&S); Ian Cabatingan (HC&S); Kela Martin (HC&S); Aaron Andrade (HC&S); Kamalu Kahookele Sili (Nahiku Community Assn. President); Mapu Kekahuna (Nahiku Community Assn. Vice-President); Corinna Kekahuna (NCA Lower Nahiku–Treasurer); Reuat Capesne (NCA Lower Nahiku-Chief of Staff); Paul Bodnar (NCA Lower Nahiku-Chief of Staff); Edward L. Reinhardt (Maui Electric Co. Ltd.); Megan Powers (Hoolawa Stream); Anthony Doum (HC&S); Ricky Helgenberger (HC&S); Roland Valle (HC&S); James Lurearez (HC&S); Steve Percbicol (County of Maui D.E.M.); Jeff Pearson (MLP); Bariface Kan0Hai Jr. (HC&S); Leonard Pagen (HC&S); Dondi Lopes; Robin Fernandez (HC&S); Clyde H. Anakalea (HC&S); Dave Lopes (HC&S); Peter Walsh (HC&S); Don Villegas (HC&S); David Agmurot (HC&S); Maximo Mariano (HC&S); Bugette Buyran (Attorney); Robert Aldosa Jr. (HC&S); Amosa Ofola Jr. (HC&S); Famas Paleafei (HC&S); Patricia Hoskin; Fred Ponce; West Kealaueo (HC&S); Ricky Sarol (HC&S); Harry Cambra (HC&S); Elskin Allan (NRCS-USDA); Ray Rutkowski (Honopou); Walter Ritte; Fovencio Rabny; Domingo Rodil; Aljon Echalas; Nestor Surbida; Fredclito Racadio; Noli R. Santos; Riki Torres-Pestana (Aina/Malama Ke Kai); Renate Greene (Lower Nahiku); Megan Powers (Hoolawa Stream); Tamara Paltin (Maui Nui Marine Resource council); Kekahuna Lihau (Lower Nahiku); Robert K. Houpo; Sven Ohech (Honopou Stream); Benny Ramos Jr.; Vance Kaanamo (Na Moku aupunio Koolauhui); Robin Newbold (Maui Nui Marine Resource council); Kolea Schonwalter; Lesley Ann Bruce; Virginia Karpovich; Robert Karpovich; Hannah Bernard (Hawaii Wildlife Fund); Kevin K. Wallett (Honopou HI); Raymond Kepani (Honopou HI); Nikhilananda; Lucienne deNaie (Sierra Club Maui); Marley Rutkowski (Honopou R. Assoc.); Candice Alelani; Eliza Reid;

Neola Caveny (Hanehoi Stream)

TESTIFIERS: Robin Newbold (Maui Nui Maine Resource Council); Carol Reimann (Maui Hotel & Lodging Assn.); Pamela Tumpap (Maui Chamber of Commerce); Kari Luna (University of Hawaii Maui College); Russell Kahookele (L.F.H. Government), Keola Caveny (Sierra Club Maui); Lucienne deNaie (Sierra Club Maui); Laura Alfonso (Maui Petroleum); Frank Domingo (M.A.GO.); Ed Reinhardt (Maui Electric Company); Irene Bowie (Maui Tomorrow Foundation); Sandra Kunimoto (HDOA); Clark Hashimoto (County of Maui); Alex Franco (Maui Cattlement's Assoc.); Tamara Paltin (Save Honolua Coalition); Tak Sugimura ; Rosemary Robbins; Kaniloa Kamaunu (Kuleana Owner); Johanna Kamaunu (Kuleana Owner); Benny Ramos (Kuleana Owner); Mae Nakahata (Hawaii Farm Bureau); Warren Watanabe (Maui County Farm Bureau); Sean Loa (American Machinery); Ken Ota (Irrigation Systems Inc.); Guy Kiaha Jr. (HC&S); Wesley Bisson (HC&S); Doug Jones (Private Owner); Alec McBarnet (Maui Oil Company); Keith Watimar (HC&S); Lenoard Pagan (HC&S); Elaine Wender; Kolea Schonwalter; Lyn Scott (Honopou Stream); Hannah Bernard (Hawaii Wildlife Fund); NikhiLananda; Darrell Naede (HC&S); Kelly Ruidas (HC&S); Sheldan R. Bigi (HC&S); Kimo Day (Wakua Nui); Walter Ritte; Robin Knox; Ricki Torres Castano; Harold Kaiser

All written testimonies submitted at the meeting are filed in the Commission office and are available for review by interested parties.

Chair Thielen's opening remarks:

> "Many of you have been in this room with us for meeting after meeting. We've been here many times for decision meetings, action meetings and public hearings. For those of you who are new, we are the Commission on Water Resource Management. This body is set up under state law enacted under the Hawaii State Legislature and one of our jobs is to set instream flow standards which is what we are here to do today. This east Maui effort began over a couple years ago with some petitions filed relating to 27 streams in east Maui.
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> "About a year ago, this Commission came and made a decision on the first eight streams and then we came back about five months ago to have a hearing and decision making on the remaining 19 streams. At that last meeting five months ago, this Commission didn't reach a decision; instead had dialogue with the various parties after hearing public testimony, and directed the parties and staff to go back and provide some additional information. We are back today to hear that new information. For those of you who were here at that hearing in December 16-17 when we were first starting to talk about these 19 streams, and all those public testimony that we heard that day, that eight hours is part of the record and before us today, all of the information that was presented to the Commission back in

> December is part of the record and part of our discussion and decision-making today.
>
> "The staff is going to limit their presentation today to just presenting the new information that the Commission asked for at the December meeting. The various groups that we asked information from gave us the information, and staff did some additional research. We pulled these groups with the CWRM staff for three different meetings between December and today, so everybody understood the information and then we can make the presentation today."

Chair Thielen introduced the commissioners and the deputy attorney general, who advised the Commission on legal questions throughout the meeting. Deputy Director Ken Kawahara introduced the Commission staff and the Division of Aquatic Resources (DAR) staff.

Chair Thielen indicated that there were three different sheets of preferences that the public could sign to express their choice for the Commission's decision. The three preferences were, 1) maintain all the water in the streams; 2) status quo for offstream diversions; and 3) balanced decision in setting instream flow standards. This method of gathering input would allow those not comfortable speaking in a public meeting to state their preference. She reminded the public that the eight hours of testimony at the December 2009 Commission meeting were part of the record, and that those that testified could still state their preferences on these sheets.

Chair Thielen added that Commissioner Sumner Erdman recused himself. Commissioner Erdman is associated with Ulupalakua Ranch, which may use water from the Maui DWS system.

Chair Thielen announced that the Commission would skip the announcements portion of the agenda and go directly to the staff presentation, after which the commissioners may have questions for the staff. She stated that the Commission is subject to the Sunshine Law, which means the commissioners cannot discuss matters among themselves except when they are in a public meeting. She added that the commissioners have not had the opportunity to discuss the staff submittal and that they need to have a chance to ask the staff questions to make sure they understand the data and information presented. The Commissioners may take breaks and /or recess during this time.

Chair Thielen mentioned the confusion in one of the newspaper articles regarding next commission meetings. She clarified that the Commission meets every month and that tentative meeting dates are indicated in the standard meetings. However, this meeting agenda included an action item that the Commission would be, after discussion, coming to a decision making on the item that day.

A. APPROVAL OF MINUTES

1. April 21, 2010
   Chair deferred action.

B. ANNOUNCEMENTS

Chair passed over announcements.

C. STREAM PROTECTION AND MANAGEMENT

1. Petition to Amend the Interim Instream Flow Standards for the Surface Water Hydrologic Units of Waikamoi, Puohokamoa, Haipuaena, Punalau, Honomanu, Nuaailua, Ohia, West Wailuaiki, East Wailuaiki, Kopiliula, Waiohue, Paakea, Waiaaka, Kapaula, Hanawi, and Makapipi, Maui

Presentation by: Dean Uyeno and Chui Ling Cheng

Deputy Kawahara thanked the U.S. Geological Services (USGS), DAR, Native Hawaiian Legal Corporation (NHLC), East Maui Irrigation (EMI), Hawaiian Commercial and Sugar (HC&S) Company, Maui County Department of Water Supply (Maui DWS), Na Moku 'Aupuni o Ko'olau Hui (Na Moku), Nahiku Community Association, and the various community groups that shared information with the staff. He also recognized the community's willingness to work together and in the past three years has cleared up much confusion and made the process easier. He repeated something that he said back in December, "There are really no bad uses for the water. If everyone can work together as a community, it's possible to seek a balance of the needs of both instream and offstream uses."

Deputy Kawahara mentioned that Ed Sakoda, Chief of the Stream Protection and Management Branch (SPAM), retired. Diane England, SPAM Branch geologist, also left the Commission. He commended the staff for being short-staffed and being able to put this together in a short period of time. Deputy Kawahara recapped that the first five (5) hydrologic units comprised of eight (8) streams and the remaining 16 hydrologic units comprised of 19 streams. He noted that multiple streams could be in one hydrologic unit.

Dean Uyeno gave an overview of the staff presentation. He mentioned he would quickly discuss the first three topics of the presentation, which were system loss considerations, ground water considerations, and alternative sources considerations. Chui Ling Cheng would then discuss in more detail the interim IFS approach, the minimum flow calculations, and the streams staff recommended for restoration. At the end of the presentation, the staff would discuss the proposed adaptive management strategies.

System Loss Considerations. Information on system losses were taken from the additional data the Commission requested at the December 2009 Commission meeting. Mr. Uyeno noted that the EMI System is 75 miles long, with 50 miles of tunnel and 25 miles of open ditch. While approximately 50 miles of the system is lined in some fashion, HC&S was unable to provide an estimate of water loss. However, the EMI system is monitored at 12 telemetry stations and that the system undergoes regular inspection and maintenance. Water on the HC&S plantation is used in conjunction with 36 reservoirs, 31 of which are unlined. According to the 1960 data, EMI estimated 23 to 31 million gallons per day of seepage losses from these reservoirs. These estimates are based on furrow irrigation practices when the water was stored in the reservoir for longer periods of time. Drip irrigation practices now rely on the reservoirs more as collection points.

Mr. Uyeno continued that Maui DWS estimated their system losses for the upcountry system to be approximately 14 percent. Mr. Uyeno said that the County has initiated an ongoing leak detection program to help reduce system losses. A greater concern is the system loss from the wooden

Waikamoi Flume on the upper Kula Pipeline. According to Maui DWS, the Waikamoi Flume Rehabilitation Design project was underway with the intent to begin construction once the design portion is complete. Mr. Uyeno emphasized that some of the adaptive management strategies in the recommendations are aimed to address some of these system loss concerns.

Ground Water Considerations. At the December 2009 Commission meeting, the Commissioners also asked the key stakeholders to look at ground water sources, and whether increasing ground water withdrawal was an option. Staff found that most of the pumping occurred at the Paia and the Kahului aquifer systems, and that reported pumpage regularly exceeded estimated ranges of sustainable yield. Mr. Uyeno noted that a table in the submittal illustrated the exceeded pumpage. The upper range of the sustainable yields reflected the possibility of return irrigation recharge and leakage from reservoirs and ditches. The staff is currently working with USGS to take a closer look at this issue. EMI currently relies on 16 brackish water wells that pump on average 72 million gallons per day. Considering the current sustainable yield and reported pumpages, it was unlikely that HC&S could sustain or even increase its use of brackish water.

Mr. Uyeno continued that Maui DWS reported that developing more ground water sources to reduce surface water demand would cost over $117 million over a 25 year planning period. Approximately 85-percent of the total cost would be attributed to electrical pumping costs. Mr. Uyeno added that the County provided five strategies that may address the anticipated Upcountry system demands. The five strategies are outlined in the submittal and in Exhibit 3, which included all the data submissions from the various parties.

Alternative Source Considerations. As indicated in the submittal and exhibit 3, HC&S discussed waste water reclamation, watershed catchment, stormwater reclamation, desalinization, developing new wells and weather modification (i.e., cloud seeding). Maui DWS identified various alternatives, such as an exchange of Hamakuapoko well water for Wailoa Ditch water, recycled water, and reclaimed stormwater. Various other strategies are discussed in the county Water Use and Development Plan.

Interim IFS Approach. Ms. Cheng reported that staff considered two approaches to setting interim IFS, the annual and the seasonal approach. The annual approach is similar to what was discussed at the December 2009 staff recommendation, which was to maintain one measurable flow standard all year round. Contrary to popular belief, streams in east Maui do not exhibit a seasonal flow pattern. The presentation slide showed a graph of the streamflow for Puohokamoa, West Wailuaiki, Paakea and Hanawi streams. The left of the graph illustrated the dry season from the months of May to October, and the right of the graph illustrated the wet season from the months of November to April. Ms. Cheng explained that all four trends showed no typical wet winter or dry summer trend, and that high streamflow occurs in both wet and the dry seasons. From the stream's perspective, the annual approach would restore streamflow to the natural flow pattern for the entire year. Since the stream animals respond to the natural flow pattern where high streamflow triggers spawning and recruitment, the annual approach would be supporting long-term growth and reproduction for the full year.

The second approach that the staff considered is the seasonal approach, which was first discussed at the December 2009 Commission meeting. Under the seasonal approach, two flow standards would be set - one in the summer and one in the winter season. Ms. Cheng added that contrary to east

Maui, rainfall in central Maui has a very distinct wet winter and dry summer trend. The presentation slide showed a graph of the rainfall trends for Kahului, Paia and Puunene areas. Rainfall is significantly low in the summer months of June through September. Conversely, the agricultural and domestic needs are high as depicted in the upward trend (i.e., trends with the dots). The black trend at the top illustrated HC&S' water demands for the full year, and that the water demands for the months of May through October are relatively high. The line at the bottom trend illustrated the water demand for Maui DWS.

Ms. Cheng noted that the seasonal approach recognized the higher water demands in the summer for agricultural and domestic purposes. The seasonal approach would establish a low flow standard for summer months to allow for offstream diversions. For stream animals, enough flow would be restored to the stream to maintain minimum connectivity for migration in the summer months. In the wet season, water flow would be restored to maintain minimum habitat availability. This explanation is outlined in Table 2, page 14 in the submittal.

Ms. Cheng continued that under the annual approach, a one time diversion modification would be needed to maintain one stable interim IFS. For the seasonal approach, a more complex diversion modification would be needed for flexible interim flow standards, as well as more oversight for implementing two flow standards.

Minimum Flow Calculations. Ms. Cheng stated that from the December 2009 Commission meeting, DAR was asked to look at the minimum flow needs for stream biota in a seasonal perspective. DAR developed a recommendation, which is included in Exhibit 3 of the submittal. Table 3 in the submittal is a summary of the DAR recommendation, i.e., their minimum flow requirements under the seasonal approach. DAR recommended that in the wet season, 64-percent of the base flow in the stream is needed in the stream to support minimum habitat in the wet season. In the dry season, 20-percent of the base flow in the stream is needed to support minimum connectivity for upstream and downstream migration for the stream animals. Ms. Cheng added that without the knowledge of the CWRM staff's monitoring locations, DAR used the estimated flow in the middle of lower reaches of the stream rather than the upper reaches, which is where CWRM staff would be monitoring. Ms. Cheng indicated that DAR staff is available for questioning.

Dr. Miike asked DAR staff, Bob Nishimoto and Glenn Higashi, for clarification on the 64-percent of median base flow. He questioned whether DAR was referring to 64-percent of the water in the stream at any time (i.e., with rainfall contribution), or the flow was specifically ground water contribution. Mr. Higashi confirmed the latter was correct. Dr. Miike asked for clarification on the three numbers listed on Table 3 in the submittal, in which the number on the far right (i.e., 64-percent of base flow) is the minimum flow needed for reproductive capacity in the stream based on DAR's analysis, and the other two numbers are arbitrarily fixed percentages of that. Dr. Miike questioned that from DAR's standpoint, whether the latter two flow numbers did not have much biological meaning. Dr. Nishimoto replied that that was correct. Dr. Miike further added that the DAR recommendation for dry season was basically keeping enough water in the stream to wet the streambed; however, stream animals cannot live and grow in that section but only to move from the lower to upper deeper areas (i.e., connectivity). Dr. Nishimoto stated that it was correct.

Chair Thielen suggested that DAR explain their recommendation in the wet and dry season, and the reasoning behind the difference numbers.

Mr. Higashi explained that the 64-percent of the median base flow (H_{min}) is to provide enough water for the stream animals to do a number of biological functions, which is to feed, reproduce, and grow. The other number (C_{min}) is the dry season connectivity flow that would be not enough water for those biological functions to actually occur. The C_{min} flow rate is to provide enough water in the stream where the animals can move between pools or to move further upstream to areas where the animals could survive.

Dr. Nishimoto added that the oopu, opae, and hihiwai all share a life cycle similar to that of salmon and eels. This kind of lifestyle is characteristic of all Pacific islands. Generally, during the spring time, babies anywhere from a quarter of an inch long migrate en masse into the stream and then make their way upstream. These babies need some water to move into that habitat. Therefore, in streams that lack connectivity flow or with low flows, the animals would be unable to reproduce, to feed, or be healthy. During the summertime with longer daylight hours, the animals are very active in reproduction and the eggs are hatched upstream. Usually during the autumn, the first flow occurs when the eggs are very small from about an eighth inch in diameter and they move downstream. This is the complete life cycle, in which the animals live about three months in the ocean and nine months in the streams. Dr. Nishimoto summarized that there are two ways of stream animal migration - incoming in the spring time and the outgoing as eggs.

Commissioner Fujiwara asked for DAR's opinion on CWRM staff's recommendation for the six streams versus DAR's nine streams. Mr. Higashi said CWRM staff was considering the same issues that DAR considered, and that DAR felt the nine streams would be the biggest bang for the buck for habitat restoration. DAR is very adamant about the H_{min} flow rates, which should be 64-percent of natural median base flow. DAR felt that that the H_{min} flow rate is necessary to provide enough water in the stream for the animals. Mr. Higashi added that it is more desirable to restore flow to H_{min} flow rates in fewer streams, rather than restoring even lower flows to more streams. Thus, the minimum flow of 64-percent of natural median base flow is very important.

Dr. Nishimoto added that DAR understood the multiple uses for this valuable resource - water. Therefore, they would prefer that one or two streams be restored to the H_{min} (rather than more streams at lower flows) because these are the streams where the babies are going to come from and with time the propagules will spread along the coastal areas and come back in other streams as well. He stated that DAR would support having interim IFS in a few good streams.

Chair Thielen said that because the commissioner was asking about the difference in the streams that were recommended, she asked the CWRM staff to explain why they took the original nine streams proposed by DAR and narrowed that down to a smaller number of streams. Since some of the Commissioners still had questions for DAR, Chair Thielen later suggested to continue with questions.

Commissioner Kiyosaki said there was discussion on the seasonal interim IFS approach and believed DAR agreed that releases during the wet season, even during times of the year that the stream was drier, would allow for migration and reproductive activity. She asked if what she stated was what DAR meant, that wet season releases provide healthy streams. Mr. Higashi said that it was correct. Commissioner Kiyosaki was confused because what she stated earlier did not appear to be what DAR had stated.

Chair Thielen asked if DAR could explain the total flow returned, under the DAR recommendation, in the dry and wet season for each stream. Mr. Higashi did not understand the question. Chair Thielen reiterated that Commissioner Kiyosaki asked if DAR was testifying that returning water to the streams in the wet season would have a benefit. Chair Thielen added that there was some confusion about the dry season amounts, and asked if DAR could explain the minimum flow levels in DAR's recommendation.

Mr. Higashi stated that the minimum flow level for the dry season is just enough water to provide connectivity so the stream animals could actually move to areas where there are deeper pools. Commissioner Kiyosaki clarified that her question was during times with no connectivity flow, the streams could still have healthy animals that are reproducing during wet season or during times when water is released downstream. Mr. Higashi agreed that at times there would be healthy animals in the streams; however, with 64-percent of the flow the animals could actually use those biological functions (i.e., migrate, grow, reproduce). He added that in the wet season, there is more water available. Commissioner Kiyosaki asked that during the dry times, the animals would live in the pools and wait until water flows downstream allowing the animals to migrate upstream. Mr. Higashi said the animals would seek areas where there are suitable habitats. During the dry season, the water temperature also has the tendency to go up in the preferred pools. The stream animals would live in these areas and when the rain comes quick enough, those animals that survive could begin to migrate.

Commissioner Balfour commented that median statistics do not represent the real world situation.

Dr. Miike referred to Commissioner Kiyosaki's question regarding minimum connectivity flow. He stated that the animals could reproduce during the wet season. He questioned DAR on the difference in quantity and quality of stream-wide restoration between the annual and minimal restoration. Dr. Miike added that the animals could reproduce when they have minimum connectivity or have enough water in the stream; however, he would like clarification on the quality and quantity of that reproductive capacity between an annual flow versus a dry season flow.

Dr. Nishimoto said that DAR did not have quantification numbers and that the data presented was based on their staff's work for over 30 years, and that the staff worked with six to ten experts. Dr. Miike repeated his question whether there was a difference in reproductive capacity. He understood that the animals could reproduce half the year of just having connectivity flow. However, he was interested in the relative reproductive capacity between connectivity provided by annual approach and the seasonal approach. Mr. Nishimoto explained during the dry season when there are isolated pools, water temperature increased and the animals are concentrated in very tight spots. At that point reproduction stops, which is the animal's response to natural stream flow in the wild. At the same time, low flow isolated pools have parasites. Therefore, the issue would not only be reproduction, but the general health of the animal.

Dr. Miike referred to Commissioner Balfour's question. Dr. Miike clarified that DAR was concerned with habitat availability, which was then translated to the amount of streamflow required to meet that habitat availability. Dr. Nishimoto agreed with Dr. Miike's statement. Dr. Miike questioned DAR that the 64-percent of natural median base flow is a specific number - for example, if the average flow is 40 mgd in the stream and 64-percent of the median base flow is maybe 5 mgd,

then the streamflow required to restore 90-percent of the habitat would be 5 mgd. Dr. Nishimoto asked that the question be repeated. Dr. Miike clarified that DAR was looking at what it would take to restore 90-percent of the habitat, which is then translated into the amount of streamflow equal to that. When DAR chose 64-percent of natural median base flow, DAR was referring to a specific number in a specific stream, which, for example, could be 5 mgd when the average flow was 25 mgd. Dr. Nishimoto agreed. Dr. Miike concluded that the 64-percent of natural median base flow is an actual number rather than a hypothetical number. Dr. Nishimoto agreed.

Chair Thielen suggested to continue with the staff presentation and that the staff would take one stream and go through one of the more detailed tables included as Exhibit 1 in the submittal.

Ms. Cheng stated a couple corrections to Table 3, page 18 of the submittal. Under West Wailuaiki Stream in the 4th column, the H_{90} flow rate should be 4.5 cfs instead of 3.5 cfs. In the total flow return under, which is the second row from the bottom, the total flow return in the dry season should be 1.2 cfs instead of 1.4 cfs as staff recognized calculation errors in the DAR methodology. Dr. Miike asked for the numbers in mgd, which is 0.8 mgd.

Ms. Cheng explained that staff analyzed DAR's recommendation, and understood how they derived their flow numbers (i.e., 64- and 20-percent of natural median base flow). Staff applied the same DAR principal to flow measurements at the locations where staff would monitor the interim IFS. In other words, staff applied the 64-percent of natural median base flow in the wet season and 20-percent of natural median base flow in the dry season. The CWRM numbers are presented in Table 4, page 18 of the submittal. Ms. Cheng explained the layout of the table, which is similar to Table 3. She added that table 4 shows the five streams from the DAR recommendation that CWRM recommended for flow restoration.

Ms. Cheng briefly went over the calculation of how DAR came up with their numbers and what CWRM did to apply the same principals to calculate numbers presented in Table 4. East Wailuaiki Stream was used as the example. Ms. Cheng explained the stream schematic, which is located on the left hand side of the presentation slide. She noted the location of the Koolau Ditch, Hana Highway, inactive continuous gage sites (yellow square symbol), ungaged sites (purple square symbol), and the estuary. In the middle of the presentation is an arrow indicating the direction of flow, and the locations of the stream reach. The upper reach is near where the Koolau Ditch is, middle reach is below the ditch, and the lower reach is near the estuary.

Ms. Cheng continued to explain the table on the left of the presentation slide. The first column is the natural BFQ_{50} or the natural median base flow in the stream. Based on that column, the upper reach has a natural median base flow of 5.8 cfs, the middle reach has a natural BFQ_{50} of 6.8 cfs, and the lower reach has a natural BFQ_{50} of 7.2 cfs. The next column is the diverted flow, and the BFQ_{50} values for the middle and lower reaches are 1 cfs and 1.5 cfs. The third column is DAR's recommendation, in which they recommended that 4.5 cfs is needed in the middle and lower reaches to provide for minimum viable habitat (H_{90}). Ms. Cheng explained that this number (i.e., 4.5 cfs) is the average of the natural BFQ_{50} in the middle and lower reaches, 6.8 cfs and 7.2 cfs, which equals 7 cfs. Then, DAR took 64-percent of 7 cfs to arrive at the wet season H_{90} flow rate, which is 4.5 cfs. The number below the 4.5 cfs in parenthesis (i.e., +3.2 cfs) indicated the amount of flow that is needed to be released to get to 4.5 cfs. They calculated that by subtracting the amount of average estimated flow that is already in the stream under diverted conditions in the

middle and lower reaches (i.e., 1.25 cfs) from the 4.5 cfs, which equals 3.2 cfs. Ms. Cheng added that the DAR survey points were in the middle and lower reaches.

Since CWRM staff's interim IFS points are near the upper gage or near the Koolau Ditch at the Hana Highway, staff applied the same principal in the wet season and took 64-percent of the natural BFQ_{50} near Hana Highway in the upper reach. In other words, staff took 64-percent of 5.8 cfs in the upper reach, which equals 3.7 cfs. That is actually the amount of flow that needs to be released from the ditch to get because near Hana Highway, the stream is relatively dry with no existing flow.

Chair Thielen clarified that information shown on the presentation slide is included in Tables 3 and 4 of the submittal, and that the Commissioners could go over the same number for the dry season in page 1-19 of the submittal for East Wailuaiki Stream. Ms. Cheng said in the dry season, the only difference is applying 20-percent instead of 64-percent. Basically, DAR took 20-percent of the average natural BFQ_{50} at the middle and lower reach (i.e., 7 cfs), which equals 1.4 cfs. The amount that needs to be restored is 0.2 cfs because under diverted conditions, an average flow of 1.25 cfs is in the middle and lower reaches. Ms. Cheng added that these flow values are included on page 1-19, in the rightmost column highlighted in orange with the heading 'DAR Recommendation'.

Chair Thielen explained to the Commission that it took some time working with the DAR staff to understand the numbers. While referring to the DAR recommendation on page 1-19 of the submittal, Chair Thielen clarified that for East Wailuaiki Stream, the DAR recommendation for the wet season of 4.5 cfs is a water level in the stream. However, the actual amount that needs to be restored to the stream is 3.2 cfs. Similarly in the dry season, while the recommendation is 1.4 cfs, the amount needs to be restored to the stream is 0.2 cfs. Chair Thielen asked for the calculation in mgd, which are 2.1 mgd for 3.2 cfs and 0.13 mgd for 0.2 cfs. The difference between the two numbers is recognizing that the stream gains ground water down in the middle and lower reaches. Chair Thielen added that Table 3 did not present the actual amount that is needed to be restored for each stream, which is significantly less because the streams are gaining streams down below.

Dr. Miike said that that the difference between the two numbers is that DAR restores the amount of flow needed to H_{90} in the stream sections that they measured. However, the drier section would not have H_{90} because instead of 4.5 cfs, it would be 3.2 cfs being restored. CWRM's method would restore an amount of flow needed for H_{90} into the dry section so that the H_{90} flow rate is maintained all the way down the stream. Ms. Cheng said that was correct and added that the staff's calculation is based on 20-percent of the upper reach estimate, which would maintain the C_{min} flow rate in the dry section of the stream as well.

Dr. Miike asked DAR that in the dry season, when DAR was referring to adding 0.2 cfs into the stream at the upper reach rather than 1.2 cfs, if that flow of 0.2 cfs would actually establish connectivity. Mr. Higashi said that the amount they were adding (i.e., 0.2 cfs) was to the lower reach. Dr. Miike asked if only 0.2 cfs was restored from the ditch to the dry section, would there actually be connectivity in that dry section. Mr. Higashi said hopefully, but Dr. Miike said that there is a big difference between a definite connectivity and a possible connectivity. Chair Thielen asked Mr. Higashi to explain the discussion with their consultant about that stream reach between the diversion and when the stream begins to gain because under the DAR recommendation, there would be less than 20-percent of the natural BFQ_{50} in that reach. Dr. Miike said all he was asking was whether that amount establishes connectivity.

Mr. Higashi said according to their consultant, that amount of flow does establish connectivity but there may be some areas that may be dry as well. He added that it is a small amount of water in the stream and the consultant was looking at it from that specific point. From the upper areas where 3.7 cfs is being released, that does not take into consideration gaining and losing areas in the stream. DAR was considering that some areas may be dry but the stream may gain some water further downstream. Dr. Miike said that the dry section would then have no connectivity.

Commissioner Kiyosaki noted that for East Wailuaiki Stream, it is gaining 1 cfs between the ditch and the middle section. Mr. Higashi agreed and said that the flow of 5.8 cfs in the upper reach is based on a long-term gaging station and those at the middle and lower reaches are estimates made from those areas where DAR conducted their survey. Thus, those numbers are not long-term gage records. Mr. Higashi added that to be on the safe side and to have enough water in the stream for fish, then releasing 3.7 cfs would be better.

Commissioner Fujiwara asked if the figures were from past records. Mr. Higashi explained that all the records were based on USGS data. He added that DAR was not certain of the flow release location and at which diversions, and that the staff was simply looking at areas with more biological benefit from the water restored. There is generally more habitat in the lower reaches than the upper reaches. Mr. Higashi further explained that not knowing exactly where the water was going to be released into the stream, DAR calculated a particular flow that would be required in different areas. When DAR discovered that CWRM is interested in monitoring in the upper reaches, DAR had already submitted the data.

Ms. Cheng summarized that both DAR and CWRM numbers are, 1) based on USGS' streamflow study; 2) applied the same methodology of 64-percent in the wet season and 20-percent in the dry season; and 3) considered gaining and losing reaches by using different base numbers. The major difference between the two sets of numbers, as DAR already pointed out, was monitoring locations. CWRM monitors in the upper reaches while DAR monitors in the middle and lower reaches. DAR also pointed out that because CWRM staff is looking at the upper reaches, CWRM used flow numbers from long-term streamflow gages instead of the regression estimates which DAR is using for the middle and lower reaches.

Streams Recommended for Flow Restoration. Mr. Uyeno referred to a summary slide to present the streams that CWRM recommended for flow restoration. The staff proposed East Wailuaiki, West Wailuaiki and Waiohue Streams for flow restoration. These streams are located east of Keanae Valley and they reflect the potential for highest biological returns, restoration over 50-percent of currently lost habitats based on DAR's habitat model, and regionally located where most cultural gathers reside. Staff also proposed Hanawi Stream for flow restoration because minimal flow was needed to achieve the desired biological diversity and minimal impacts would be felt by HC&S. Staff proposed Waikamoi Stream for flow restoration largely due to the regional approach that was suggested in the December 2009 Commission meeting. Of the three streams DAR identified west of Keanae which included Waikomoi, Puahokamoa and Haipuaena streams, all are used for conveyance. However, Waikamoi Stream reflects the most cultural gathers and the fewest obstacles for diversion modification should restoration be approved.

Mr. Uyeno added that while staff recognized that the stream's use for conveyance was an oversight, staff believed that the interim IFS for Waikamoi Stream could serve as a test case and seek biological returns when the stream is used as a conveyance. DAR indicated that there would not be any biological benefit in restoring flow at the Maui DWS system elevation. Thus, any modifications to Maui DWS diversions in meeting the interim IFS was not necessary.

Lastly, Makapipi Stream was not recommended by DAR but proposed by CWRM staff for flow restoration because it reflects the important use of the water by the Nahiku community for cultural practices, recreation and other instream uses. Area residents also testified that taro cultivation would be practiced should more water become available. However, staff also recognized the hydrological uncertainty at Makapipi Stream and thus recommended the conditional release of water past the one major EMI diversion on the stream with the intent to determine the sustainability of the proposed interim IFS.

Mr. Uyeno continued that staff recommends one measurable interim IFS to the 16 surface water hydrologic units being considered and these are presented in the submittal. Based on the adaptive measurement strategies proposed, staff identified four general actions under the implementation portion. These were extended actions that are again presented in the submittal. Mr. Uyeno focused the discussion on the tiered approach that staff has taken to implement the recommended flow restoration for the six streams.

Basically, staff divided the adaptive management into three phases: short-term actions, mid-term actions and the long-term actions. Mr. Uyeno read from the general recommendations on page 24 of the submittal:

> IMPLEMENTATION
>
> SHORT-TERM ACTIONS
> The short-term recommendations represent interim IFS that shall be implemented in a period of one (1) year from the date of adoption.
>
> - East Wailuaiki Stream: The proposed interim IFS for East Wailuaiki Stream below all EMI diversions and just above Hana Highway, near an altitude of 1,235 feet, shall be established at an estimated flow of 3.7 cubic feet per second (2.4 million gallons per day).
> - West Wailuaiki Stream: The proposed interim IFS for West Wailuaiki Stream below all EMI diversions and just above Hana Highway, near an altitude of 1,235 feet, shall be established at an estimated flow of 3.8 cubic feet per second (2.5 million gallons per day).
> - Hanawi Stream: The proposed interim IFS for Hanawi Stream immediately below the EMI diversion, near an altitude of 1,300 feet, shall be established at an estimated flow of 0.1 cubic feet per second (0.06 million gallons per day). This proposed interim IFS aims to create a wetted pathway directly below the EMI diversion to provide connectivity for stream biota.
> - Makapipi Stream: The proposed interim IFS for Makapipi Stream below all EMI diversions and just above Hana Highway, near an altitude of 935 feet, shall be established at an estimated flow of 0.93 cubic feet per second (0.6 million gallons per day). Due to the uncertainty of existing hydrogeologic conditions of Makapipi Stream, this interim IFS will be subject to a conditional release of water by EMI and monitoring by Commission

staff. Should an estimated flow of 0.93 cubic feet per second be unattainable, the interim IFS may be revised by a future Commission action. Adjustments to ground water development tunnels will not be required.

MID-TERM ACTIONS
The mid-term recommendations represent interim IFS that shall be implemented in a period of one (1) year after the implementation of the short-term recommendations.

- Waikamoi Stream: The proposed interim IFS for Waikamoi Stream below all EMI diversions and just above Hana Highway, near an altitude of 550 feet, shall be established at an estimated flow of 4.3 cubic feet per second (2.8 million gallons per day).
- Waiohue Stream: The proposed interim IFS for Waiohue Stream below all EMI diversions and just above Hana Highway, near an altitude of 1,195 feet, shall be established at an estimated flow of 3.2 cubic feet per second (2.1 million gallons per day).

LONG-TERM ACTIONS
The long-term recommendations represent implementation actions that shall be achieved within a three (3) year time frame from the date of adoption.

- Maui DWS initiate rehabilitation and construction on the Waikamoi Flume within three (3) years. The reconstruction of the extremely leaky Waikamoi Flume is the least expensive alternative water source for Maui DWS Upcountry customers. Maui County is required to reduce waste and system loss. If action is not taken to initiate construction in this time period, then the Commission shall be obligated by law to reduce Maui DWS' diversions due to waste.

Mr. Uyeno read the following recommendation from page 25 of the submittal:

MONITORING
- HC&S currently reports monthly water use for four stations in its telemetry system. Upon approval of these recommendations, HC&S shall begin reporting water use for the other four stations in its system that are also continuously recorded (Wailoa Ditch at Opana, Kauhikoa Ditch at Maliko, Lowrie Ditch at Maliko, Haiku Ditch at Maliko). If EMI is unable to provide monthly water use reports, sufficient justification should be provided to Commission staff.
- There are currently four gaging stations in the EMI telemetry system that do not continuously record data. EMI, in coordination with Commission staff, shall identify and install continuous recorders at these four gaging stations within one year. If EMI is unable to install a recorder, sufficient justification should be provided to Commission staff.
- EMI, in coordination with the Commission and USGS, shall seek to cooperatively fund and undertake a system efficiency study to accurately determine EMI system losses and/or gains. Should such an effort not be possible, Commission staff shall report back to the Commission.
- HC&S, in coordination with the Commission and USGS, shall undertake a system efficiency study to accurately determine HC&S reservoir system losses.

- Maui DWS, in consultation with Commission staff, shall regularly report monthly water use or related monitoring data (e.g., ditch flow, reservoir levels, pumpage amounts, etc.) on forms provided by the Commission.
- Staff shall monitor streamflow by taking periodic flow measurements, subject to available funding, at the proposed interim IFS locations, as weather permits. These will be point-in-time measurements; however, the installation of stream gaging stations remains an option for long-term management.
- Periodic biological surveys shall be conducted, subject to available funding, to monitor the response of stream biota to post-interim IFS implementation.
- Any party claiming to be negatively impacted as a result of the adopted interim IFS shall monitor and document, in cooperation with staff, the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.
- Likewise, any party claiming that negative impacts are a direct result of actions (i.e., diverting too much water, violating the interim IFS) caused by another party, shall monitor and document the impact upon instream or noninstream uses, including economic impacts. Data shall be provided to staff to substantiate any claims.
- All claimants shall cooperate with staff in conducting appropriate investigations and studies, particularly with regard to granting access to stream channels and private property related to such investigations, subject to the provisions of the State Water Code, Chapter 174C, HRS.

EVALUATION

- Within one year from the date of adoption of an interim IFS, staff shall report to the Commission on the progress of implementing the interim IFS and the application of the adaptive management strategies outlined above, and the impacts of the interim IFS upon instream and noninstream uses.
- Within one year, HC&S/EMI shall report to the Commission on the status and implementation of the proposed interim IFS.
- Within one year, Maui DWS shall report to the Commission on the status of efforts to rehabilitate the Waikamoi Flume and other steps being taken to improve system inefficiencies.
- Staff shall assess the implementation of these strategies on an as-needed basis, as may be necessary upon consultation with the affected parties.
- Staff shall continue to provide quarterly updates to the Commission during the course of the year.
- Should there be changes to the operational status of HC&S, changes to the current water uses declared by HC&S, and/or any substantial changes in water needs as determined by the Commission or Commission staff, staff shall reassess the interim IFS for streams affected by the EMI System.

REPORTING

- Maui DWS shall submit annual reports to the Commission at a regular Commission meeting detailing the progress of the Waikamoi Flume design and construction until that rehabilitation construction is completed.
- HC&S shall submit annual reports to the Commission detailing the end use of water originating from east Maui streams. HC&S shall obtain agreements and/or provide

existing agreements with any entity that receives water from the HC&S/EMI water delivery system to provide data on the ultimate end use of such water in these annual reports. HC&S shall work with Commission staff and present a draft report format to the Commission for review no later than September 2010.

RECOMMENDATION (as taken from the submittal): Staff recommendations are presented in order of the hydrologic units codes, from west to east.

WAIKAMOI (6047) RECOMMENDATION:

Waikamoi and Alo Streams: In the matter of the Petition to Amend the Interim Instream Flow Standard for Waikamoi and Alo Streams, staff recommends that one measurable instream IFS be established for Waikamoi Stream below the confluence with Alo Stream. The proposed interim IFS for Waikamoi Stream below all EMI diversions and just above Hana Highway, near an altitude of 550 feet, shall be established at an estimated flow of 4.3 cubic feet per second (2.8 million gallons per day).

Wahinepee Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Wahinepee Stream, staff recommends that one measurable interim IFS be established for this stream. The interim IFS below all EMI diversions and just above Hana Highway, near an altitude of 575 feet, shall remain as designated on October 8, 1988. This is equivalent to an estimated flow of 0.5 cubic feet per second (0.32 million gallons per day) cfs based on USGS estimates of total flow at Q_{95} (TFQ_{95}).

PUOHOKAMOA (6048) RECOMMENDATIONS:

Puohokamoa Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Puohokamoa Stream, staff recommends that one measurable interim IFS be established for this stream. The interim IFS below all EMI diversions and just above Hana Highway, near an altitude of 565 feet, shall remain as designated on October 8, 1988. This is equivalent to an estimated flow of 0.4 cubic feet per second (0.26 million gallons per day) based on USGS estimates of total flow at Q_{95} (TFQ_{95}).

HAIPUAENA (6049) RECOMMENDATIONS:

Haipuaena Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Haipuaena Stream, staff recommends that one measurable interim IFS be established for this stream. The interim IFS below all EMI diversions and just above Hana Highway, near an altitude of 510 feet, shall remain as designated on October 8, 1988. This is equivalent to an estimated flow of 0.1 cubic feet per second (0.07 million gallons per day) based on USGS estimates of total flow at Q_{95} (TFQ_{95}).

PUNALAU (6050) RECOMMENDATIONS:

Punalau/Kolea Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Punalau/Kolea Stream, staff recommends that one measurable interim IFS be established for this stream. The interim IFS below all EMI diversions and just above Hana Highway, near an altitude of 40 feet, shall remain as designated on October 8, 1988. This is equivalent to an estimated flow of 0.2 cubic feet per second (1.36 million gallons per day) based on USGS estimates of total flow at Q_{95} (TFQ_{95}).

HONOMANU (6051) RECOMMENDATIONS:
Honomanu Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Honomanu Stream, staff recommends that one measurable interim IFS be established for this stream. The interim IFS below all EMI diversions and just above Hana Highway, near an altitude of 20 feet, shall remain as designated on October 8, 1988. This is equivalent to an estimated flow of 0 based on USGS estimates of total flow at Q_{95} (TFQ_{95}).

NUAAILUA (6052) RECOMMENDATIONS:
Nuaailua Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Nuaailua Stream, staff recommends that one measurable interim IFS be established for this stream. The interim IFS below all EMI diversions and just above Hana Highway, near an altitude of 110 feet, shall remain as designated on October 8, 1988. This is equivalent to an estimated flow of 3.1 cubic feet per second (2 million gallons per day) based on USGS estimates of total flow at Q_{95} (TFQ_{95}).

OHIA (6054) RECOMMENDATIONS:
Ohia Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Ohia (Waianu) Stream, staff recommends that one measurable interim IFS be established for this stream. The interim IFS below all EMI diversions and just above Hana Highway, near an altitude of 195 feet, shall remain as designated on October 8, 1988. This is equivalent to an estimated flow of 4.6 cubic feet per second (2.00 million gallons per day) based on USGS estimates of total flow at Q_{95} (TFQ_{95}).

WEST WAILUAIKI (6057) RECOMMENDATIONS:
West Wailuaiki Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for West Wailuaiki Stream, staff recommends that one measurable instream IFS be established for this stream. The proposed interim IFS for West Wailuaiki Stream below all EMI diversions and just above Hana Highway, near an altitude of 1,235 feet, shall be established at an estimated flow of 3.8 cubic feet per second (2.5 million gallons per day).

EAST WAILUAIKI (6058) RECOMMENDATIONS:
East Wailuaiki Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for East Wailuaiki Stream, staff recommends that one measurable instream IFS be established for this stream. The proposed interim IFS for East Wailuaiki Stream below all EMI diversions and just above Hana Highway, near an altitude of 1,235 feet, shall be established at an estimated flow of 3.7 cubic feet per second (2.4 million gallons per day).

KOPILIULA (6059) RECOMMENDATIONS:
Kopiliula Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Kopiliula Stream, staff recommends that one measurable instream IFS be established for this stream. The proposed interim IFS for Kopiliula Stream below all EMI diversions and just above Hana Highway, near an altitude of 1,270 feet, shall remain as designated on October 8, 1988. This is equivalent to an estimated flow of 0.5 cubic feet per second (0.32 million gallons per day) based on USGS estimates of total flow at Q_{95} (TFQ_{95}).

Puakaa Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Puakaa Stream, staff recommends that one measurable interim IFS be established for this

stream. The interim IFS below all EMI diversions and just above Hana Highway, near an altitude of 1,235 feet, shall remain as designated on October 8, 1988. This is equivalent to an estimated flow of 0.6 cubic feet per second (0.39 million gallons per day) based on USGS estimates of total flow at Q_{95} (TFQ_{95}).

WAIOHUE (6060) RECOMMENDATIONS:
Waiohue Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Waiohue Stream, staff recommends that one measurable instream IFS be established for this stream. The proposed interim IFS for Waiohue Stream below all EMI diversions and just above Hana Highway, near an altitude of 1,195 feet, shall be established at an estimated flow of 3.2 cubic feet per second (2.1 million gallons per day).

PAAKEA (6061) RECOMMENDATIONS:
Paakea Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Paakea Stream, staff recommends that one measurable interim IFS be established for this stream. The interim IFS below all EMI diversions and just above Hana Highway, near an altitude of 1,265 feet, shall remain as designated on October 8, 1988. This is equivalent to an estimated flow of 1.5 cubic feet per second (1 million gallons per day).

WAIAAKA (6062) RECOMMENDATIONS:
Waiaaka Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Waiaaka Stream, staff recommends that one measurable interim IFS be established for this stream. The interim IFS below all EMI diversions and at Hana Highway, near an altitude of 1,235 feet, shall remain as designated on October 8, 1988. This is equivalent to an estimated flow of 0.

KAPAULA (6063) RECOMMENDATIONS:
Kapaula Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Kapaula Stream, staff recommends that one measurable interim IFS be established for this stream. The interim IFS below all EMI diversions and just above Hana Highway, near an altitude of 1,194 feet, shall remain as designated on October 8, 1988. This is equivalent to an estimated flow of 0.2 cubic feet per second (0.1 million gallons per day).

HANAWI (6064) RECOMMENDATIONS:
Hanawi Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Hanawi Stream, staff recommends that one measurable instream IFS be established for this stream. The proposed interim IFS for Hanawi Stream immediately below the EMI diversion, near an altitude of 1,300 feet, shall be established at an estimated flow of 0.1 cubic feet per second (0.06 million gallons per day). This proposed interim IFS aims to create a wetted pathway directly below the EMI diversion to provide connectivity for stream biota.

MAKAPIPI (6065) RECOMMENDATIONS:
The balance of instream and noninstream uses for Makapipi Stream considers both the importance of diverted streamflow for the EMI System and the Nahiku community which relies on the stream for cultural practices, recreation, and other instream uses. With the uncertainty of gaining and losing reaches along most of the stream's course to the ocean, it is not known whether restored flow would result in continuous streamflow from the headwaters

to the stream mouth. A coordinated study of a short-term release of water past the one major EMI diversion should be sufficient to determine the sustainability of the proposed standard.

Makapipi Stream: In the matter of the Petition to Amend the Interim Instream Flow Standard for Makapipi Stream, staff recommends that one measurable interim IFS be established for this stream. The proposed interim IFS below all EMI diversions and just above Hana Highway, near an altitude of 935 feet, shall be established at an estimated flow of 0.93 cubic feet per second (0.6 million gallons per day) based on USGS estimates of total flow at Q_{70} (TFQ_{70}). Due to the uncertainty of existing hydrogeologic conditions of Makapipi Stream, this interim IFS will be subject to a conditional release of water by EMI and monitoring by Commission staff. Should an estimated flow of 0.93 cubic feet per second be unattainable, the interim IFS may be revised by a future Commission action.

GENERAL RECOMMENDATIONS:
Staff recommends approval of the following adaptive management strategies for all sixteen of the hydrologic units being considered:

IMPLEMENTATION

GENERAL ACTIONS

- Staff shall seek to enforce the provisions of the State Water Code should any unauthorized, non-registered or non-permitted diversions be discovered in the course of its fieldwork. Staff recommends that all owners of unauthorized diversion works structures contact staff to file the necessary applications to seek compliance with all permitting requirements set forth by the Code.
- Staff shall coordinate with EMI to identify and determine appropriate actions with regard to attaining the proposed interim IFS values downstream of existing diversion structures.
- Staff shall continue to assess existing conditions and the status of all EMI diversions, in coordination with EMI and the DAR, to develop the necessary modifications to improve habitat conditions for stream biota.
- Any party diverting water from a stream shall be responsible to maintain system efficiencies, minimize offstream water losses, and minimize impacts to the natural stream resource.

Chair Thielen mentioned that she asked staff to give the Commission the calculations for the total flow return recommended by DAR in the wet season and dry season in million gallons per day, since that's the system that we're used to see as opposed to the cfs measurements, and what it would be under CWRM recommendation and the DAR numbers for the five or six streams that CWRM is recommending. The numbers would be provided to the Commissioners when ready.

Dr. Miike asked for clarification, that in one of the previous submittals by the parties, HC&S reported one measurement and he understood they measure in certain places so staff really didn't know how much loss from the diversions to those points, and it reflects what staff said that there's no seasonal variation in streamflow. He believed it was 155 million vs. 157 million. How much more is being withdrawn by the DWS system? What is the total being withdrawn? He understood staff didn't know the losses between the diversion points and those measurements, but just wanted to know what the total numbers were.

Chair Thielen said that in the eight streams in the DAR's recommendation and the six streams in CWRM's recommendation, how many streams also serve the Maui DWS system, where the interim IFS recommendation would affect the Maui DWS system. Mr. Uyeno said as far as the CWRM recommendation it would only be Waikamoi, the Upper Kula system diverts from Puohokamoa, Haipuaena and Waikamoi, while the Lower Kula system diverts from those same three in addition to Honomanu.

Chair Thielen asked the Commission to be aware that the streams listed by DAR as well as the streams listed by CWRM only one of those streams would have an affect on the Maui DWS system.

Dr. Miike asked if he was correct in assuming that the Maui DWS system diverts about 8 mgd based on a chart that had been provided earlier. Mr. Uyeno confirmed that the figure was correct, on average.

Chair Thielen asked the audience to remember that all the information that was in the submittal in front of the Commission in December (e.g., the offstream needs and uses of the water, the economic impacts on the island, the desires of the local communities vs. communities in Upcountry Maui that are served by the Maui DWS water system, HC&S, the Farm Bureau, the importance of agriculture in the State of Hawaii, the fact that that's in our state constitution as well) is still in front of the Commission and on the record. This submittal by the staff is just the additional information that the Commission asked for. Chair Thielen reminded the audience that the Commission met last in December and is coming back now in May, the Commission will take public testimony but that public testimony was also heard for about 12 hours a little over a year ago when the Commission dealt with the first eight streams, along with public testimony for over eight hours in December and that many in the room provided testimony which is very much in the Commissioners' minds. What the Commission would like to do is to get to the point to provide some time with the main parties, which would be the Nahiku Community Association, Native Hawaiian Legal Corporation, HC&S and Maui Department of Water Supply, to digest the materials and provide a more detailed presentation to the Commissioners, and have some back and forth questions with them. Chair Thielen said that after running three public meetings with 8 to 12 hours of testimony, the Commissioners are mentally exhausted at that point and it's very difficult for them to be able to have that dialogue with the specific groups. Chair Thielen asked if people want to testify, but also asked if people were willing to stand on their prior testimony before the Commission. She again mentioned that there are three sheets available where people could state their preferences when they came into the room, which would allow the Commissioners to get to the more detailed discussions and presentations by the groups.

Chair Thielen asked for a show of hands from those who would stand by their prior testimony. Chair Thielen then asked for those who would want to testify in front of the Commission today. She asked those who want to testify to come and sign up.

Recessed: at 2:20 p.m.

Chair Thielen called the meeting of the Commission on Water Resource Management back to order at 2:45 p.m.

Minutes

Chair Thielen announced that there are 40 people who signed up to testify and asked them that when they come up, get to the point, and tell the Commission what they want them to do. The Commissioners respect this and understand that this is a very difficult decision and affects many people in this room in many ways but what will be most helpful, if they have a suggestion, a number, an approach or a suggestion and get to the point. Chair Thielen noted she would impose a two minute time limit so there is time for the groups and their presentations.

1. Robin Newbold (Maui Nui Marine Resource Council) – the Council supports the recommendation of DAR's restoring levels in the eight east Maui streams
2. Carol Reimann (Maui Hotel & Lodging Assn.) – supports HC&S survival
3. Pamela Tumpap (president, Maui Chamber of Commerce) – support offstream uses for HC&S
4. Kari Luna (University of Hawaii Maui College) – support HC&S
5. Russell Kahookele (L.F.H. Government) – restore all water, take out diversions
6. Keola Caveny (Sierra Club Maui) – support full restoration
7. Lucienne de Naie (Sierra Club Maui) – support DAR's recommendation
8. Laura Alfonso (Maui Petroleum) – supports HC&S
9. Frank Domingo (Maui Agriculture Company) – find the water
10. Ed Reinhardt (president, Maui Electric Company) – supports HC&S
11. ~~Ray Rutkowski~~ -
12. Irene Bowie (Maui Tomorrow Foundation) – streams right to exist
13. Sandra Kunimoto (HDOA) – agree with different instream flow standards, wet/dry for agriculture
14. Clark Hashimoto (County of Maui) – supports agriculture, upcountry
15. Alex Franco (Maui Cattlemen's Assoc.) – supports agriculture
16. Tamara Paltin (Save Honolua Coalition) – support restoring streamflow
17. Tak Sugimura – supports biofuel efforts and HC&S' role
18. Rosemary Robbins – supports farmers, HC&S, upcountry
19. Kaniloa Kamaunu (Kuleana Owner) - entitlements
20. Johanna Kamaunu (Kuleana Owner) - entitlements
21. Benny Ramos (Kuleana Owner) - entitlements
22. Mae Nakahata (Hawaii Farm Bureau) – does not support staff recommendations
23. Warren Watanabe (Maui County Farm Bureau) – supports agriculture
24. Sean Loa (American Machinery) – supports HC&S
25. Ken Ota (Irrigation Systems Inc.) – supports farmers, agriculture
26. Guy Kiaha, Jr. (HC&S) – asks the Commission to hurry up and make a decision
27. Wesley Bisson (HC&S) – supports HC&S
28. Doug Jones (Private Owner) – supports DAR's recommendations
29. Alec McBarnet (Maui Oil Company) – supports HC&S
30. Keith Watimar (HC&S) – supports HC&S
31. Lenoard Pagan (HC&S) – supports agriculture
32. Elaine Wender – supports to restore water
33. Kolea Schonwalter – return water to the streams
34. Lyn Scott (Honopou Stream) – supports water being returned to the streams
35. Hannah Bernard (Hawaii Wildlife Fund) – reuse water, not stream water
36. Nikhilananda – supports HC&S, natural resource for everyone
37. Darrell Naede (HC&S) – support HC&S

38. Kelly Ruidas (HC&S) – supports HC&S, no summer releases
39. Sheldan R. Bigi (HC&S) – supports HC&S
40. ~~Kimo Day (Wailuanui) -~~
41. Walter Ritte (of Molokai) – supports staff recommendations
42. Robin Knox – treat the stream water with respect
43. Ricki Torres Castano – make a decision today
44. Harold Kaiser (University of Hawaii, College of Tropical Agriculture & Human Resources) - reconsider directing water in summer to support Kula Ag Park

Public testimony closed at 4:15 p.m.
Chair Thielen explained that after the presentations are done and after the Commissioner's questions are done, they will take a break and then the Commissioners will deliberate. Under the Sunshine Law, the Commissioners cannot talk to each other about this unless it is in front of the public. The Commission may call up staff; there are also USGS representatives here in case there are any questions on the baseline numbers that were used by staff. Chair Thielen said that they did meet with the parties to go over the numbers that were provided because the numbers are confusing and she wanted to make sure that everybody understood what those numbers were and what the information was that was provided by each of these groups between December and now. There have been three meetings with these groups so that there could be an informed presentation to the Commissioners.

Recessed.

Chair Laura Thielen called the meeting of the Commission on Water Resource Management back to order at 4:40 p.m. She informed that they would be allowed 15 minutes for their presentations.

Presentation by Groups:

Nahiku Community Association (Kamalu Kahookele Sili, President; Mapu Kekahuna, Vice President; Corinna Kekahuna, Treasurer; Paul Bodnar, Safety Director; Lihau Kekahuna, Director of Environmental Management and Public Works)

Ms. Sili submitted a petition for those who support the taro farmers and the Hawaiian Sugar Commercial Company employees. Ms. Sili started by thanking the Commission for their consideration of Makapipi Stream. She asked that any studies respect the culture and addressed the impacts of low streamflow upon water quality (e.g., dengue fever, west nile virus), recreation, livelihood, and traditional gathering. Ms. Sili questioned the hydrologic findings of DAR, then raised the issue of stream cleaning and the impacts to streamflow of alien plant/animal species and drilled wells.

Mapu Kekahuna stated they are in support of taro farmers and agriculture, and not in support of more development on Maui. Homeowners already cannot be supplied with meters due to the lack of water. The community does not grow taro commercially, but they do grow taro for family consumption and support the livelihood and cultural practices which does include gathering from the stream. The ecosystem has been impacted by the lack of streamflow and is deteriorating. Mr. Kekahuna noted the health risks due to the lack of a consistent flush of the stagnant, non-flowing stream, as noted by State Board of Health official Dr. Lorrin Pang. He also stated that he personally

did not know what 0.6 mgd looks like, and while they would like to see all the streams fully restored, they realize that this is not realistic and want to find a common ground and what is fair. He suggested that the Commission look at permits that cause impacts to the stream (e.g., a recent approval of a low ford crossing across the stream channel) and private wells that may impact streamflow, while seeking a common ground that balances the uses.

Corinna Kekahuna raised issues on water catchment, the domestic use of water from Makapipi Stream, county water supply lines, proposed subdivisions, private water wells, and stream channel alterations. She supports staff recommendations for restoration.

Paul Bodnar noted that Monsanto Company utilizes desalination and so A&B should also look at desalination to meet their water needs.

Lihau Kekahuna reported on stream conditions for April 22, 2010 indicating that Makapipi streamflow was very high and overtopping the EMI diversion at the 1,000 ft. elevation. He suggests building a reservoir in the middle of the stream that would store water and allow overflow to flow into the ditch system when rainy. He would like to see Makapipi perennial again as he is one of the last gatherers on the stream.

Chair Thielen asked if the Nahiku group understands the staff recommendation that because of the hydrology the staff is not sure that if there is a release of water, that it may not go all the way down because streams of gaining and losing reaches. There were also concerns that there may me losing reaches for other reasons and so more work would need to be done on that as well. Did they understand that their recommendation was conditional because staff was not certain of the hydrologic conditions and would be working with the community of determining the impacts. If water was not moving down the stream, the Commission may come back and reassess. Similarly, if there was information about the offstream impacts, the Commission may come back and reassess. Chair Thielen stated that she wanted to make sure the Nahiku community clearly understood the staff recommendation, that there was no guarantee that a release would go down to the ocean, and that all the information they have now is that Makapipi is probably a losing stream. Mr. Kekahuna replied that that's what he's been told, but water doesn't just disappear and that since he was a kid it flowed from the top all the way down to the ocean. Unless something is sucking the water out at the lower portions making the water disappear, he can't believe that the water will not be there at hgiher flow, but something they can look at with the staff and come to a compromise.

Chair Thielen said they want to make sure that they understand what the information that the staff has and if the Commission decides to do a release then the recommendation would to be working with the Nahiku community to do some observations and see what happens after that.

Dr. Fukino asked if there is actually a planned development for the stream. Mr. Mapu Kekahuna said that early on last year there was a permit that was processed with the Commission and it was approved for the alteration of Makapipi Stream for a low ford crossing so the owner can get across to their property. He noted that could impact the flow of the stream and maybe that's where the water was disappearing to, he don't' know. Mr. Kekahuna did not know about the progress of that project, but there's also other people trying to get subdivision approvals to get water from the County of Maui, but there's a 'show me the water' thing which is one of the biggest issues. When he says no development due to lack of water, he believes they need to look

at what they are creating out here what's taking all that water out here. Sugar cane is an important facet of agriculture and the community supports that but what they do not support is more development of the island until another source of water supply is put into place and can sustain growth.

Dr. Fukino said in the last report one of the things that was mentioned was a reservoir. Mr. Lihau Kekahuna said there's a wall that blocks the top of the water from flowing down to the bottom. All that top water, which was full this past Sunday, all that water is going in the ditch and not coming down the river. He stated that he just wants Makapipi to live. Maybe they're not going to have 100-percent of the water but just something for keeping it alive so that he can gather to feed his family who depends on him. Mr. Kekahuna won't share his river knowledge with anybody, but he can be responsible enough to guide certain officers in the department and take them where they need to go take a look at it.

Native Legal Hawaiian Corporation: (Alan Murakami, Camille Kalama)
Alan Murakami wanted to start by summarizing his clients' perspective to the current situation, which he described as chaotic. He noted that HC&S' argument has largely been based on economics and not the law, because the Constitution is on the side of his clients. While the Code does provide for reasonable and beneficial uses, the Commission has had to speculate on HC&S' use of the water. His client's rights are protected under the Code and the Commission is not supposed to balance at the outset, rather the scope of traditional rights must first be established and protected. In the interest of precaution, there must also be reasonable margins of safety for protecting instream resources. What has been presented is a percentage of a percentage of a percentage (i.e., Of a total 110 streams and 388 diversions in the EMI system, only 19 streams are at issue with only 64-percent of the baseflow being considered in some streams).

For streams used as conveyance (Waikamoi, Puohokomoa, Haipuaena, and Kopiliula), there is no scientific basis for not restoring these streams, rather a solution would be to install pipes to convey the water.

For the streams that have not been recommended for restoration by CWRM or DAR, again, there is no scientific basis and it appears to be based on the uncertainty of the data. Rather, there is a threshold level of protection that should be afforded these other streams.

Referring to his Powerpoint presentation, Mr. Murakami presented a pie chart that EMI currently diverts approximately 88-percent of the water in east Maui. The County of Maui diverts about 3-percent, half of which goes to Kula farmers. He noted that his clients support the Kula farmers and that they should receive their water before HC&S because they produce food that is consumed immediately. The Commission's September 2008 decision restored approximately 3-percent of the water to east Maui streams, with this submittal proposing an additional 6-percent restoration. Thus, he believes, only a relatively small amount of water is being considered.

Mr. Murakami presented a second pie chart that included DAR's proposed restoration amounts and estimated system losses. He questioned the model differences in estimated water use calculations for wet and dry seasons provided by HC&S and the Commission staff, and urged the Commission to follow-up on studying system losses. He noted that A&B pays a quarter of a cent per thousand gallons and questioned why they would fix system losses when the water is so cheap. In summary,

Mr. Murakami argued that fixing the system losses could account for the restoration of water that DAR/NHLC is proposing. He noted that order needs to be brought to the chaos by looking at facts not fiction, and that the Commission needs to follow the law and not the economic arguments that have been made. The water restoration should come first, and it should be HC&S' burden to show that they are not wasting the water.

Chair Thielen asked for a hardcopy of NHLC's powerpoint presentation.

Dr. Miike asked that based on Mr. Murakami's testimony, did he correctly assume that H_{90} restoration which is not a full restoration, was NHLC satisfied with that? Mr. Murakami said that he can't say that he is satisfied, but if there's nothing really else that they can objectively point, they are willing to say that that is rational and would reasonably protect the resource unless the adaptive management strategies show otherwise. Dr. Miike asked if NHLC was looking for a balanced approach. Mr. Murakami agreed. Dr. Miike then asked that while NHLC testified that they are pleased with what CWRM staff recommended versus the seasonal approach, they'd like more of the streams restored? Mr. Murakami said that's correct and thinks it's justified under the law. Dr. Miike asked Mr. Murakami that he mentioned something about the legal principal and wanted to see if he agreed that not being in a non-water management area common law applies. Mr. Murakami agreed. Dr. Miike said there are only two water rights of the common law, appurtenant and riparian. Mr. Murakami said that's where they differ, pointing out traditional and customary rights. Dr. Miike agreed, but clarified that regarding instream uses those with those rights can use the water in a reasonable manner but only under riparian and appurtenant lands correct? Mr. Murakami agreed, speaking strictly, that it is a land based right. Dr. Miike asked if they have that right (appurtenant or riparian) to take that water and transport it elsewhere and still say that they have the right to do that? Mr. Murakami said that he did not believe so. Dr. Miike said that the DLNR licensing agreement is for HC&S to take the water and move it away. The only use that HC&S can be justified under is not by rights but that those without rights don't need the water in a reasonable manner, while those that are transporting the water elsewhere can use it but as long as they use it reasonably. Mr. Murakami agreed, but with one important qualification, that it is the burden of the diverter to show that no one that has the right is being harmed. Dr. Miike stated that those with the rights need to come forward and say 'we want to use that water' and they have that right whether or not others transport it elsewhere and are using it in a reasonable manner. Mr. Murakami agreed, and noted that reasonable use for the offstream use was irrelevant in that circumstance. Dr. Miike continued that there are two issues, one is whether the offstream users that transport the water out are using it in a reasonable manner, and even if it's reasonable that if you have a right and they don't, you still get water. Mr. Murakami agreed. But, Dr. Miike asked, is NHLC willing to compromise on using H_{90} as a restoration for instream uses. Mr. Murakami said yes, and what they've basically done is taken the middle ground, and he thinks that there should be reasonable margins of safety which would happen in the adaptive management strategies to see whether or not those margins are in fact within the 64-percent of base flow. Dr. Miike noted that if the Commission votes to have the H_{90}, they're going to see if that actually happens.

Chair Thielen asked Mr. Murakami to let the Commission know what his position is on the annual approach vs. the seasonal approach for the streams where there's no on-stream domestic or taro farming. Alan Murakami said they certainly don't agree with the minimalist approach of wetted rocks as being sustainable. NHLC supports the abandonment of that the seasonal approach because it is not scientifically based. Chair Thielen checked that his preference is the annual approach, and

Mr. Murakami agreed. Mr. Murakami noted that Mr. Kimo Day, who had to leave, was going to testify as a fisherman that even though there is a major losing stream, such as Honomanu, water that disappears underground still creates a healthy estuarine environment. Chair Thielen noted that as far as the seasonal approach and the staff recommendation as an option, the streams are gaining streams.

HC&S (Chris Benjamin, General Manager; Rick Volner, Senior Vice President; Garrett Hew, Water Resources Manager)

Mr. Benjamin started by stating that the Waiahole case is different from the east Maui case in that the former dealt with the allocation of unused water abandoned by prior users, whereas the latter concerns fully committed water provided by people in businesses today and determination of whether that water should be restored to the streams. Mr. Benjamin said that HC&S recognizes the need for compromise and have constructively participated in the daily gatherings and discussions leading up to this Commission meeting. While HC&S does not entirely support staff's recommendations, they do support the recommendation on Makapipi stream and the concept of wet season releases; however, HC&S has concerns about releases on both East and West Wailuaiki streams, and most importantly, they oppose any dry season flow releases other than on Makapipi Stream.

Mr. Benjamin noted the importance of the sequence of events leading up to this Commission meeting, and that this decision on the 19 streams could not be looked at in isolation with the previous 8 streams the Commission ruled on nearly two years ago. The Commission provided restoration in five out of eight streams to meet the taro needs. Although not the primary purpose of the instream flow standards, the flow restoration also provided additional stream habitat in the prior decision. The flow releases are estimated to be 10 mgd on average, not the 4.5 mgd as noted in the staff submittal.

Mr. Benjamin explained that last December, the Commission took action on the remaining 19 east Maui streams, streams where there were no known taro cultivation except for one stream (i.e., Makapipi Stream) that was not diverted by EMI. These streams were gaining streams and staff concluded that the stream reaches below the diversions were believed to support current instream uses. Flow release was recommended only for Makapipi Stream.

By the end of the December 2009 Commission meeting, wet season releases were emerging as an acceptable compromise for instream and offstream demands. Data collection detailed their wet season vs. dry season water needs, provided available data on brackish water wells, reservoirs and diversion structures, provided research performed on potential alternative sources of water including catchment systems, and fish pathways to aid migration. HC&S needs all the east Maui water it uses, utilizes their ground water wells to maximum the extent, and does not have any viable alternative sources for this east Maui stream water at this time. The data provided further proof that there is direct correlation between higher water availability and higher yields at HC&S. HC&S believes that the staff recommendation reflects both a degree of restoration and seasonality that would be too costly for the public. It's too much water and much of it would be taken at a time when it's needed most. Unfortunately, both options presented for annual and seasonal approaches incorporated dry season releases that would have a significantly greater impact on existing uses than releases in the wet season.

Mr. Benjamin said what the staff's analysis lacks is the wet season vs. dry season demands for east Maui water. He showed a chart that overlaid HC&S season needs on Figure 7 of the submittal which is considerably larger in the dry season than the wet season. Figure 7 depicts median flows over a 65 year period which serves to mask the actual high and low flows that is experienced on a daily basis with ditch flows. During low flow times, the combined effect of the IFS imposed previously on the five east Maui streams plus the proposed dry season IIFS for these six additional streams will result in as much as a 50-percent reduction in the water available for the County and HC&S. Mr. Benjamin noted the restoration of water via the Commission's earlier decision on the first set of east Maui streams and that decision on releases in Na Wai Eha is still pending. From HC&S vantage point, reductions in surface water available to HC&S also reduce groundwater available due to reductions in irrigation recharge. Furthermore, the Commission's prior action on the first set of streams and staff's proposal results in a considerable amount of water being restored from one region that is a reliable producer of water during low rainfall times.

From a biological perspective DAR advocates spreading restoration out geographically. Mr. Benjamin said that the proposed IIFS for east Wailuaiki be accepted but the IIFS for west Wailuaiki be rejected. A zero dry season release is the right thing to do for the recommended streams because there are no known taro needs on these streams and no new data was presented, these are gaining streams, offstreams users have no alternative sources of water to compensate for instream releases, the DAR submittal indicated that the recommended dry season flows are too low to expect suitable long-term growth and reproduction of native stream animals, and DAR also stated that additional habitat created in the wet season is of significant biological benefit. He noted that the Code specifically requires the Commission to consider economic impacts when setting an interim IFS and that the submittal falls short of addressing economic impacts of the proposed stream restorations on offstream users.

Mr. Benjamin indicated that he is concerned of staff's statement on page 15 of the submittal that with decreasing trends in streamflow, east Maui streams will continue to be an insufficient supply of surface water needs for the plantation regardless of the interim IFS adoption. This seems to imply that because HC&S is water-short, being more water-short won't matter. Despite losses of $30 million the prior year, operational results have improved dramatically. In addition, federal research support for renewable energy efforts are encouraging; however parties looking to partner with HC&S often ask whether there will be enough water available to produce sufficient biomass to warrant the investment necessary for the biofuel industry. Mr. Benjamin urged the Commission to follow through with the direction indicated in the December meeting, reject the concept of ordering additional releases in the dry season, and look only at the proposed wet season releases. He believed that the wet season-only IFS is an appropriate compromise because, in totality, the Commission would have provided water for known taro farmers, additional stream habitat, and gathering rights in east Maui, while having properly performed the weighing test required by the Code.

Dr. Miike referred to HC&S' statement that staff failed to provide an analysis of economic impact, but he believed that all the information provided by HC&S and their employees testifying indicate the dire consequences of the entire operation going out of business. He believed what the staff asked is what would be the incremental effect by reducing available water by 1-, 5-, 10-, 15-percent upon the business. HC&S has managed to still be in operation when the stream waters were decreasing over the past 20 to 30 years, so there has not been information provided by HC&S to say

what the economic impact would be from incremental decreases of water for the plantation. Dr. Miike found it offensive what Mr. Benjamin was telling the Commission staff.

Mr. Benjamin responded that their yields over the last several years show a downward trend that has been driven by the reduction of water availability. There's no question about the relationship between water and yields, and there's also no question about the relationship between yields and revenue. It is well documented that there have been significant investments in drip irrigation, recirculation of water, and other things to maximize the use of water. The best reference in the staff's submittal is the fact that HC&S is pumping the aquifers to the maximum extent possible. Dr. Miike noted that that was not his question, but rather why has HC&S not provided information about what would happen to the operation (i.e., profitability, going out of business, etc.) if there were incremental decreases of water availability. All the information the Commission has is if HC&S were to go totally out of business. Mr. Benjamin said that the analysis that was done and has been referenced in the past, shows that there is an over 95-percent correlation between water application and sugar yields and that the relationship there is every million gallon of water can produce four tons of sugar. That relationship is critical because every million gallons of water that HC&S loses results in four tons less of sugar. Dr. Miike then asked at what point would HC&S go out of business. Mr. Benjamin noted that there are many complexities and variables in business. Dr. Miike compared Mr. Benjamin's response to a scientist saying that more research was needed, but then stated that the presentation by staff did not contain an explanation of HC&S' reasonable uses but noted that it was provided in Exhibit G-1 (of Exhibit 2, Compilation of Data Submissions, Part II) that provided HC&S' average monthly water need and availability.

Dr. Miike noted that he was confused by the last column in the table that depicted monthly deficits, where the highest one was 108, yet it also showed 165 and 230 mgd. Then he realized that the 165 and 230 mgd was the difference between what was calculated as water need minus ground water contributions so that's what was needed from surface water. So the real numbers really should be 8.4 million and 71 million gallons per day instead of 165 and 230 shown. Chair Thielen clarified with Dr. Miike which table he was referring to, which she then noted was the one Garret Hew had just passed out.

Rick Volner indicated that the right column is the per day deficit, the difference between the total water needed subtracting out the average water deliveries, then subtracting out the average well water. Chair Thielen clarified that the numbers Dr. Miike was referring to were at the bottom of the last column (165,919,453 and 230,623,125 gpd). Mr. Volner noted that those were summary rows for both the dry and wet seasons and what they would need, on average, from surface water. Dr. Miike clarified that the deficit in Nov-Apr is really 8.4 million and May-Oct is 71.3 million if the averages are added together. Dr. Miike asked if it was correct that HC&S had a deficit in the wet season of 8 million gallons per day and in the dry season 71 million gallons per day. Mr. Volner responded that was correct.

Dr. Miike continued that he believed HC&S had a 20-percent overestimate of their need. He explained that if you start with daily evapotranspiration rates and transfer that into gallons per acre per day. In the text along with the table, HC&S didn't count any rain water with the reason being that it is reflected in evapotranspiration rates, but what is reflected in the evapotranspiration rates is higher humidity at lower temperatures. They also said that it might rain so much that it overflows

but HC&S counts zero in terms of net irrigation from rain. HC&S didn't provide numbers, so he couldn't estimate, but explained that HC&S didn't count any rain where irrigation is.

Mr. Volner agreed that for this analysis they didn't include any rainfall, because they couldn't predict when the rain was going to fall. Dr. Miike argued that the numbers in the table were based on historical data and measured evapotranspiration rates, and HC&S has data for rainfall in those periods, so they could have added another column for rainfall to subtract from what the evapotranspiration losses were. Dr. Miike then concluded that they seem to be overestimating.

Dr. Miike then continued that HC&S has testified in the past, that in a 24-month growing season, the last six months hardly any water is used for ripening and the last one or two months no water is used at all for drying before harvest, and that's six months out of 24 which would be 25-percent. He continued saying that, conservatively, it's a reduction of 10-percent not 25-percent, because the numbers (in the table) say that HC&S is putting water back equal to evapotranspiration every day of that 24–month period. Mr. Volner stated that's a gross estimation of their ripening process, where during the summer months it's a much more condensed process that's maybe only three months and the final dry out could be as short as 30 days, which depends throughout the year. Dr. Miike concluded that it's a rough 10-percent overestimate.

Dr. Miike continued noting that the numbers are applied to 30,000 acres. In the Na Wai Eha area HC&S has a total of 5,300 acres but only 4,770 acres were actually irrigated, so there was 530 acres of infrastructure and about 10-percent of the total was not irrigated. Mr. Volner said that wasn't correct. Dr. Miike contended it was based on the record that was provided in the Na Wai Eha case, where HC&S irrigates 3,650 acres in Waihee-Hopoi and 1,120 in Iao-Waikapu. Mr. Volner said there is a total of 5,300 acres irrigated crop acres in Na Wai Eha. Dr. Miike disagreed because HC&S provided information that Waihee-Hopoi fields were 3,650 and Iao-Waikapu is 1,120, which don't add up to 5,300. Mr. Volner said that in Na Wai Eha, HC&S has 5,300 acres under irrigation. Dr. Miike countered that the records shows that HC&S has 5,300 total acres. Dr. Miike further explained that if 10-percent of the 5,300 acres is not irrigated (for Na Wai Eha), comparing to the 30,000 acres (irrigated with east Maui water), that means 3,000 acres is not irrigated and HC&S would be irrigating 27,000 acres. Dr. Miike noted his bottom line is, when looking at HC&S' total water needs and considering his conservative 20-percent, instead of a deficit of 8.4 million (gpd) in the period for Nov-Apr he finds that HC&S is in excess of 24 million (gpd) in that period, while in the May–Oct period HC&S has a deficit of 71 million, he agreed that there is a deficit but it's only 21 million (gpd). He finished by saying that those are very large numbers.

Mr. Volner responded to the acreage numbers, saying that there are 43,000 acres in their farm that HC&S controls. They are farming 36,000 acres of that, so there are only 7,000 acres that are put aside for infrastructure like roadways, reservoirs, and fallow areas that are not farmed. He agreed that they don't agree on the Na Wai Eha numbers, but what is irrigated by east Maui (water), HC&S has in excess of 30,000 crop acres.

Dr. Miike argued that there is a total plantation area of 35,000 acres according to the information provided in public testimony to the Commission. Recognizing that the differences in numbers would not be resolved, Dr. Miike, based on information on the record, found that HC&S are at least overestimating by 20-percent and most likely more because of the conversion of the evapotranspiration and the efficiency factor. On the efficiency factor, HC&S testified that 80-

percent (of the water) reaches the plant. When asked where HC&S got that, it was some number that HC&S used, while the industry standard is 85-percent. Dr. Miike noted that we wasn't using that factor in his numbers and recognized that HC&S would argue otherwise, but he needed to raise the issue for the record.

Commissioner Balfour raised the evapotranspiration figures for July, August and September and commented that 0.32, 0.31 and 0.29 seem very low considering the central valley of Maui. Personally, he looks at those numbers with suspect and would think it would be greater. Mr. Volner remarked that evapotranspiration does vary throughout the year and one difference that they did note when they looked at staff's water model, was that the HC&S water model is somewhat more robust in that it takes into account wind speeds and temperature, something that the other models may not take into account.

Chair Thielen asked Mr. Volner to explain further, in response to the point that Commissioner Balfour had raised regarding evapotranspiration rates likely being higher during the summer months. Chair Thielen said it was noted on the table that what's presented is an average evapotranspiration that's measured by 12 meteorological stations throughout the plantation, then asked if these were actual measurements or was the data run through a model to arrive at those figures. Mr. Volner responded that these are actual measurements from automated weather stations located throughout the plantation, which are then we acre weighted based on that meteorological station (due to micro-climates throughout the plantation) and it's an average since 1986 to 2009. Chair Thielen then asked if HC&S was putting actual measurements into a model based upon actual planting. Mr. Volner clarified that the model only comes into account when figuring out what their actual irrigation needs, thus using evapotranspiration as the first step in determining what the irrigation needs are.

Dr. Fukino noted that the timeframe used was 1986 to 2009 and that it was wetter during part of that time than it is right now. Was there a reason for using a longer period of time as opposed to a ten year increment? Mr. Volner said they used this data set because it was numbers they had to represent surface water deliveries, ground water pumping and what covered their automated weather stations. They did not have all 12 weather stations in effect prior to 1986 so that was the point where HC&S had all the data that overlapped. Dr. Fukino said it is a long period of time they used (1986-2009) and wondered why they choose such a long period of time when the issue now is there's no water as opposed to doing decade increments to show changes. Mr. Volner said they felt the long period of time would help even out some of the real lows and real highs and get a better idea of HC&S deals with within this period, which includes periods of drought, average water flows, and good rainfall as well.

Commissioner Fujiwara asked if the total acres in the plantation are 36,000 acres, is there a magic number that HC&S needs to maintain to be economically successful. Mr. Benjamin noted that it's a very good question and not to be evasive, but it's an ongoing question. HC&S has at times cultivated more acres than at times fewer acres. In general, more crops mean more revenue so the more they can farm the better. And certainly over time HC&S has tried to maintain the size of the plantation where it is. It has gotten difficult especially in drought years, but as a general rule more is better, because there are fixed operation costs so the more revenue the better. However, Mr. Benjamin did acknowledge that there are certain areas on the plantation (e.g. rocky acres) where it is more difficult to farm and costs are higher, so they are constantly evaluating whether they get

incremental value from them. He said it is difficult to arrive at a magic number, but that he could say with certainty that if they ever had to trim the plantation by 10-percent it would be very difficult, if not impossible, to cover all of their fixed costs. He reiterated the difficulty in dealing with averages and that the best indicator that HC&S needs the water and does not have enough water is the fact that they spend as much as they do to pump as much groundwater as they possibly can.

Commissioner Fujiwara asked what the highest rainfall area that HC&S grows sugar cane. Mr. Volner responded that the highest rainfall area is along the Maliko boundary and on average could get up to 65 inches of rainfall, generally concentrated in December through March time period though February tends to be dry as well. Commissioner Fujiwara asked if in the history of HC&S, did they ever try to grow un-irrigated cane. Mr. Benjamin and Mr. Volner did not know of any efforts. Commissioner Fujiwara said that McBryde on Kauai grew a lot of un-irrigated cane, then asked if HC&S has even considered growing that variety of cane in un-irrigated situations. Mr. Volner responded that the Kauai situation probably has more dependable year-round rainfall, whereas the Maliko rainfall, though high, tends to be very seasonal.

Commissioner Kiyosaki referred to what HC&S said about the previous releases on the first set of streams that were looked at in east Maui. The Commission heard a comment that the amount was 4.5 or 12, but HC&S said 10, which is actually more than what was required and why was that happening. Commissioner Kiyosaki said she was struggling a little, since there was an understandable push to move those hydrologic units forward because of the taro growers, but it would have been good to look at the entire region for everyone's sake. Unfortunately, the Commission couldn't because they didn't have all the information, but why did HC&S indicate 10 mgd earlier. Mr. Volner said that it should be noted that staff provided an estimate of 4.5 mgd, but they feel that it's extremely low and it's closer to the order of 10 mgd. They believe there were some mistakes in assigning groundwater above or below the diversion and having it applied to what's actually being released. As an example, in Waiokamilo all the diversions were closed as of June 2007, so there are zero diversions going on there and that, according to USGS, represents about 3.17 mgd alone just in Waiokamilo. So when you add up all the other streams, they believe it is much closer to 10 mgd.

Chair Thielen noted that HC&S testified that they opposed the dry season, but support the seasonal approach, thus oppose any restoration during the dry season. She wasn't clear on what HC&S' testimony was on the wet season. Does HC&S agree with the recommendation of either DAR or CWRM staff on the wet season restoration levels? Mr. Benjamin said he could not say that he fully understood the discussion earlier about the differences but what he could say is they think the staff recommendation with respect to Makapipi is fine, and that for all streams with the exception of west Wailuaiki, they support the staff recommendation with respect to the winter months. Chair Thielen asked if HC&S had an alternative recommendation for west Waialuaiki or do they recommend that this Commission do zero restoration for that stream. Mr. Benjamin responded, yes, it's the latter. The reason is because of it's proximity to east Waialuaiki and also the other five streams that have been restored. He also noted that it's a highly productive stream for HC&S so when weighing the instream and offstream uses they felt that restoration of one of the two streams achieved the instream benefits while preserving the offstream benefits.

Chair Thielen said that the Deputy AG asked her to clarify for the crowd that when she mentioned that they have met with the groups, it was the Commission staff and Chair Thielen herself that met

with the groups and not all the commissioners because again under the Sunshine Law they cannot meet as a group that's outside a public meeting. The staff and Chair met with all the parties to make sure they understood the numbers, and granted it's very complicated, but she wanted to do a quick comparison of the recommended wet and dry season numbers in the staff's submittal.

Chair Thielen noted that the amount of water that would be proposed to be restored to the streams is a different number from the interim IFS for that stream, whereby in some streams water is bypassing the diversion and going downstream. As an example, if there are 2 mgd of water going downstream bypassing the diversion and an interim IFS is set at 5 mgd, since the stream already has 2 mgd, the proposal would be to restore 3 mgd. Chair Thielen wanted to make sure the audience understood that the interim IFS is different from the flow amount to be restored.

Chair Thielen said between the CWRM and DAR recommendations for the amount to be restored, there is about a 5 cfs difference between the two recommendations during the wet season. Chair Thielen sought confirmation from Ms. Cheng, who asked which streams. Chair Thielen clarified for the five streams that DAR and CWRM are in agreement with, plus Makapipi. Ms. Cheng agreed and responded that, in mgd, it would be less than two mgd. Chair Thielen asked if HC&S had a chance to look at those different recommendations on the wet season between the DAR and CWRM recommendations and if they are acceptable, or if not, could HC&S propose some alternatives. Chair Thielen reiterated that she is talking about the wet season restoration levels.

Mr. Volner responded that, based on the staff's explanation, HC&S supports CWRM staff's recommendation, with the exception of west Waialuaiki but including Makapipi and Hanawi, those amounts for the wet season restoration only. Chair Thielen then asked about DAR's dry season recommendation for Waikamoi, because there isn't water bypassing that stream, and whether they would have issues with that. She noted that there is a proposal for 0.1 cfs restoration of Waiohue and Hanawi and a 0.2 cd restoration of east Wailuaiki during the dry season by DAR, recognizing that NHLC doesn't support just a small amount of water being released downstream to the gaining sections so that there is some connectivity. Chair Thielen asked if HC&S is objecting to even those levels of restoration during the summer or dry season. Mr. Benjamin acknowledged that yes, they are objecting to dry season flows.

Chair Thielen mentioned that a couple of people testified that rather than doing studies, taking those funds and investing in developing alternative sources of water, to relieve some of the pressure on the system. She asked if HC&S had any thoughts on that. Mr. Benjamin did note that there was discussion on alternative crops and other things. Part of their comprehensive review on where they can take the plantation in the future is going to look at all these things. However, looking at water sources and alternative crops is going to take many years to develop and HC&S has to survive as a sugar plantation for the foreseeable future. Mr. Volner added that HC&S has a long history of looking at alternative water sources and development of water sources and will continue to look at that because, as stated earlier, there is a tremendous correlation between yield and water application.

Chair Thielen mentioned that there is also a series of recommendations in the submittal on monitoring, evaluation and reporting requiring that in the event that the Commission does order water restored to certain streams there would be, in addition to the modification of the diversions, requirements for gaging or measuring of flows to provide more accurate or timely data. In addition, some efforts shall be taken to update loss studies for the reservoirs systems, and also annual reports

to the Commission on the end use of the water. She clarified that that would be the final end use of the water, because if HC&S is coming forward now saying that this Commission should make a balance and weigh the fact that they are using this water for agriculture, if that end use changes in part or in whole then this Commission is entitled to have notice of that in an annual report, then it may need to reweigh that balance. There has been a history with large scale agriculture where some of that water, for business or other reasons, may be stopped being used for agriculture and sold for other purposes. This reporting requirement is intended to capture those uses, so this would account for the final end user of the water and not just the first entity that the water was transferred to. So for these general conditions on monitoring, evaluation and reporting, does HC&S have any objections, clarifications or modifications to propose to this Commission?

Mr. Benjamin started by saying that they have absolutely no problem with transparency on these issues. He gathered from staff's presentation that there would be reasonable consideration of what is reasonable to do. He emphasized that they want the water to grow sugar cane and they have no problem with the stipulations to the extent that what it's for. Chair Thielen wanted to make clear that while some of the recommendation will consider what is reasonable based on information that is provided, others recommendations are not written as optional (e.g., updating reservoir loss studies). She noted that she wanted to hear from HC&S if there were any objections to the recommended adaptive management strategies. Upon further clarification from Chair Thielen, Mr. Benjamin stated that the strategies were fine.

Chair Thielen recapped that for the wet season recommendations for the four streams and the Makapipi annual recommendation HC&S would agree with the CWRM recommendation, but they request no restoration on west Waialuaiki and no dry season restoration.

Commissioner Kiyosaki stated that there were a lot of testimonies about water loss in the system and as Commission, they take water conservation seriously. From what she's read, the ditch system is fairly tight with not much loss there, except for the wooden flume which she believed Maui DWS is addressing, so it comes down to the reservoirs. She expressed concern that since HC&S is pumping so much ground water and water seeping through is recharging ground water, she's not sure how that will balance out. If HC&S was not pumping the water and the reservoirs were seeping into the ground, then there would be reason to tighten it up. Mr. Benjamin agreed.

Chair Thielen stated that it would need to be taken into consideration when they figure out the parameters for the study. Dr. Miike stated that he would take the contrary position that if HC&S were saving those losses, that water would be available for irrigation. Seepage never equals 100-percent of what is being put into the reservoir, so if seepage loses could be stopped there would be a net gain in the water received. The pumping reflects not only the seepage from the reservoir, but across the whole application and the system. Regarding the issue about the ditches being "tight", Dr. Miike stated that he didn't believe that was what the information was, rather it's that HC&S doesn't know what it is because it's not known how much is diverted from the streams and while they might know how much is in certain ditches, they don't know how much has been lost. Commissioner Kiyosaki said from what she read was that the ditches are basically lined.

Chair Thielen asked HC&S to explain. Garrett Hew said that EMI has roughly 75 miles of ditches and tunnels. Out of those 75 miles, 50 miles are tunnels underground so the water that goes through tunnel are not subject to evaporation losses. Those 50 miles of tunnel areas are mainly lined and the

parts that aren't lined go through very hard basalt rock. There are other sections that are open (25 miles) that are also lined and there is basically just one ditch that's not lined which is the Lowrie Ditch. Out of the whole system, 50 miles are lined. Dr. Miike noted that in their data submission on the losses, HC&S said they don't really know what they lose even if there's concrete and it depends on the material. HC&S said they could do particular studies that took measurements at particular sections so they would know the loss, but that would be very complex. While he accepts the notion that there is no loss over basalt, even a lined section could be cracked. Considering the whole ditch system, Dr. Miike believed that the best they could tell is they don't know what the loss is.

Maui Department of Water Supply: (Mayor Charmaine Tavares; Director of the Department of Water Supply, Jeff Eng)
Jeff Eng distributed a handout.

Mayor Charmaine Tavares started by saying that the decision of the Commission today will have a serious impact on their community, the Upcounty community which includes many residents and small businesses, 10 schools, 11 churches, and 3 medical care facilities. The County needs about 8 mgd from this source to sustain Upcountry Maui. There are approximately 9,900 meters issued from the Maui DWS and of that, there are 752 agricultural meters which include both the large and small farmers and ranchers. Water availability would be severely reduced or eliminated if Waikamoi is included detrimentally in the IFS considerations. Mayor Tavares urged the Commission to consider the needs of almost 10,000 people in Upcountry.

Director Jeff Eng said the County appreciates that the Commission staff recognizes the importance and value of surface water to meet the domestic and agricultural water needs of upcountry Maui. Director Eng stated that the methodology used by the staff used to establish the interim IFS is preferred over the methodology used by DAR because the basis of staff's methodology is more rational and intuitive. He focused on three points; the first is whether to establish IFS on an annual or seasonal basis. He noted that the domestic and agricultural needs in upcountry Maui are seasonal. Referring to the handout dated July 15, 2008 depicting the average monthly water demands plotted over a calendar year, Director Eng said that the County of Maui asks the Commission to support the seasonal interim IFS, where the interim IFS is higher in months of lower customer demands and lower in months of higher customer demands.

Director Eng's second point was in regard to the specific streams to which additional flows were recommended to be restored. The County of Maui is particularly concerned that the Waikamoi stream is recommended for additional flow restoration. This stream is extremely important to the Upcountry water systems, including the the Upper Kula Waikamoi flume, the Lower Kula Pipeline and the Makawao-Pukalani System via the Wailoa Ditch. In severe drought conditions, the staff recommended interim IFS of 4.3 cfs or 2.8 mgd could result in emergency mandatory water restrictions for all upcountry Maui domestic and agricultural water users. The Kula agricultural park farmers could end up with no water. Under such severe drought conditions, the staff's recommended interim IFS would essentially mean that stream restoration has priority over the domestic and agricultural water needs of the community.

One very important thing to realize is that the Puohokamoa and Haipuaena streams, which are located nearby and adjacent to the Waikamoi stream, are not proposed for full restoration because

they are used to convey water from one ditch to another. And as the staff pointed out earlier in their correction, the Waikamoi stream is also used similarly for conveyance. For this reason, the County of Maui believes that the Waikamoi stream should not even be considered for additional flow restoration.

Lastly, Director Eng wanted to comment on the percentage of habitat restoration. The County certainly supports restoration of habitat for native stream animals; however, as it is referenced in the staff's submittal it seems evident that further studies might be needed to objectively and empirically determine the amount of sufficient stream flow restoration for adequate habitat restoration. Therefore, until such empirical information becomes available, the County of Maui asks the Commission that it takes a conservative approach to habitat restoration, by starting initially at a lower percentage of habitat restoration. The County asks that the staff's calculated H_{50} flows be the starting point. Later, as new data warrants it, the percentage along with the interim IFS could be adjusted.

In regards to actual impacts to customers on the Upcountry systems, Director Eng referred Upcountry water report handout dated July 15, 2008. On that particular date, Wailoa Ditch had a flow of only 11.7 mgd. If you were to deduct the amount of flow restoration that staff recommends, of 10.46 mgd, there would have been only 1.2 mgd for domestic water users, agricultural users, Kula agricultural park and the plantation.

In response to the staff's other recommendations and conditions that were specific to County, the County will continue its efforts to control and correct its water system losses. It will continue to progress to replace the Waikamoi flume and Maui DWS will report its progress as required by the Commission and will continue with plans to develop new storage and ground water sources for Upcountry Maui.

Dr. Miike asked for clarification where Director Eng mentioned 10.46, is that the total flow restoration? Director Eng referred to Wailoa Ditch on the handout, where Waikamoi and many of the other streams are diverted into, that was the sum of the total available diversions on that particular date (11.7 mgd on July 15, 2088). It is not just the Waikamoi stream source. So, that is how much was available in Wailoa Ditch on that particular day. Therefore, if streamflow was restored to the level of 10.46 mgd recommended by staff, there would have been only 1.2 available. Chair Thielen said there are six streams that the staff is recommending restoration to, which ones feed into that ditch system and it was her understanding is that it's just one, Waiakamoi. Director Eng said it was all of the streams that are diverted into the Wailoa Ditch.

The Commission asked for further clarification of the Upcountry water report. Director Eng explained the different columns for each reservoir. Dr. Miike asked for clarification where under Wailoa Ditch it says that flow in ditch is 11.7, but the percent is 5.9; does that mean that total flow in the ditch is 11.7. Director Eng clarified that capacity for Wailoa Ditch is about 200 mgd, so that from 11.7 mgd is approximately 5.9-percent of full capacity. Dr. Miike asked how much water flows in that ditch on an average day. Director Eng responded that it varies, and right now it was down to about 40 mgd. Dr. Miike noted that the Commission is not talking about emptying that ditch, rather it's taking a certain percentage of it and it doesn't mean that that water is not available. Director Eng responded that if the recommended interim IFS were in effect, then to satisfy the interim IFS there would be 10.46 million gallons less in the ditch. He further explained that on a

day like today there's 40 mgd and with the 10.46 mgd diverted there would be net 30 mgd. The report provided was meant to provide a worst-case scenario and what happens during drought periods.

Chair Thielen asked if when Director Eng was talking about the recommended restoration he meant the wet season; that is if the Commission took a seasonal restoration approach as opposed to the annual restoration, he did not want the dry season restoration. Director Eng said that was correct. Chair Thielen said the total dry season restoration under the DAR's number is about 1.2 cfs and asked for comments on the seasonal approach. Director Eng said he could accept the staff's dry season interim IFS and, focusing on the habitat percentage, would like to start at the H_{50} during the wet season.

Chair Thielen recapped that Maui DWS recommendation is no restoration for Waikamoi, the recommendations on the dry season restoration under the CWRM calculation (except for Waikamoi), and for the wet season would vary and start at the H_{50} levels under Table 4 (until there is further information). If DAR's preference is to use H_{90} even if it were with fewer streams, is Maui DWS just looking at the totals that would be restored or does it matter how many streams (e.g., if flow were restored to three streams at H_{90} vs. four streams at H_{50}). Director Eng said he would have to review some of that data to see what the net flow would be in those streams and how much would remain in Wailoa Ditch particularly on a drought condition period.

Dr. Miike asked for further explanation on the Upcountry water use report which depicted totals that are in the 50 and 60 mgd and demands in the range of 7.3 to 9.1 mgd. Director Eng said the total is the total amount stored water in all of the reservoirs and in the far right column is the total demand on the system for that particular day. Dr. Miike asked if he is saying that the other sources, Kahakapao and Piiholo reservoirs, are not available to the Upcountry farmers. Director Eng responded that some of them are. On that particular day (July 15, 2008) the Olinda facility would basically shutdown because they don't have much storage, and there's only 22.3 million gallons of stored treated water that was served to customers around the Piiholo Road area. The Piiholo facility was producing 2.4 million gallons per day so that did serve a lot of the lower Kula system. Dr. Miike said his question is that Director Eng started out by looking at the worst case on July 15, 2008 where if Wailoa ditch was as 11.7 and if you took 10 out there wouldn't be enough water, yet there is a total of 63.3 mgd. How much of the 63.3 mgd is available to the users that he said wouldn't get any water, if 10 mgd were taken out from the Wailoa Ditch. Director Eng said there is probably enough capacity for Piiholo to help supplement the Lower (Makawao-Pukalani) system. Director Eng emphasized the unique complexity of the system and the need to manage the system daily including treating water at the upper levels and dropping it down, versus treating it at the lower Kamole level and pumping it up to Upcountry.

Chair Thielen said that the bottom line is that Maui DWS would support the dry season restoration levels as manageable, and would not support using the higher habitat levels on an annual basis. Director Eng agreed.

Chair Thielen asked if Director Eng had to look at waste and estimate the amount per day what's lost in that system, what would that level be. Director Eng said they don't have an estimate. They try to make regular inspections and address it whenever a leak is reported. He knows that when there is high rainfall up there the flume is going to have water coming out of it because the flume is

under-designed, so he really can't answer that. Director Eng noted that they were fortunate that when the design consultant inspected it back in March they went up there during a storm period so they could see the magnitude of water and believes they will design the new flume based on their observations. Chair Thielen said the Commission walked that system and doesn't think it's a matter of a single leak, but rather the system was leaking the entire length of the walk. She asked if they were to look at compensating or putting water back into the stream, which Maui County seems to support in concept, without harming people in the Upcountry area, replacing that flume with some kind of pipe system would be a situation where nobody Upcountry would lose any water and, in fact, might likely gain water while still having that stream restoration. So there is a recommendation in the staff submittal, recognizes the difficulties in contracting and procurement, but the bottom line is that Maui is dependent on 85-percent of its water from streams and Maui County is publicly supporting some stream restoration. If you take a look at who can bear the cost of developing alternative supplies and creating a better balance so that not so much is dependent on the stream, it would be a collective people of Maui which is represented by the Maui County.

Chair Thielen noted the recommendation in the submittal is that construction on a new or reconstructed flume begin in three years and that there be annual reports to the Commission in public meetings by Maui County until that reconstruction is completed. Is that acceptable to the County and Maui DWS. Director Eng agreed that it was. Chair Thielen also noted that some testifiers supported alternative water sources to be developed to change that balance so that the County isn't 85-percent dependent on stream water. Chair Thielen asked if that's something where, if there are requirements placed on Maui County, where Maui County would like to see some direction, focus or partnership with any of the parties here? There was some testimony about injection wells and instead using reclaimed water for agricultural purposes. Since Maui DWS gets a percentage out of the EMI ditch system, would the County be interested in working with HC&S on coordinating some alternative water being used for irrigation in exchange for increase in the percentage of stream water that goes to the County vs. for irrigation purposes in the fields? Are these things something the County would be interested in pursuing and if so, how can the Commission assist that with some guidance.

Director Eng said that they would like to partner with anyone they possibly can who can help develop alternative services. Maui DWS is currently looking at some new groundwater sites in the Haiku area but is facing some challenges from the community. He also noted water conservation efforts that Maui DWS is undertaking to improve water supply and reduce system losses. Chair Thielen agreed that water conservation is important, but emphasized that the County needs to take a look at shifting that balance of 85-percent reliance on stream water, so that the only major water developer is going to be the County. If water development is left in private hands, then they will develop water towards high end uses that can afford to pay those higher water rates which may not be the type of development that Maui County wants. Chair Thielen, in an effort to push Director Eng out of his comfort zone, emphasized that people need to address the reality that it's going to take everybody in this room having to bear a percentage of the cost of changing that balance within Maui County. The only entity that can have everybody share that cost is the government through the capitol improvement projects in the budget.

Director Eng commented on reclaimed water opportunities, stating that the County has no wastewater treatment facilities in Upcountry since most people are on cesspools and septic tanks so they don't have that reclaimed water opportunity. Chair Thielen stated that since Maui DWS takes

a percentage of the water from the EMI system, they could increase that percentage taken from the EMI system by working HC&S to provide alternative irrigation in central Maui. Director Eng agreed.

Mayor Tavares states that not too long ago the County empowered a task force to look at uses for the reclaimed from the three wastewater treatment plants on Maui and that committee is meeting together and there's been a lot of focus on the injection wells since millions are spent to treat the water, then it's dumped into the injection wells, along with debate about effects to ocean water. Mayor Tavares emphasized that it's been her goal to find ways to use that reclaim water because she believes it's a water resource. They will continue to go down that path to find a way to use that water and if they can offset uses that would preserve domestic uses by using the reclaimed water, then it's a win-win for everybody especially for rate payers. Mayor Tavares recognizes that water on Maui is the cheapest water in the State of Hawaii, but when they talk about raising rates and they talk to Council about rate increases, they say that's too much and they can't do that. She recognizes that it takes everyone working together and understanding what the challenge is.

Chair Thielen said that one of the things in the staff submittal is that HC&S will to need to take a look at updating the loss study on the reservoir system. HC&S could spend millions of dollars lining their reservoirs, or they could spend millions of dollars combined with a County effort to bring water from a wastewater plant and put it onto the fields. There are some options for the community to get some creative thinking behind that and would benefit Maui County and working with HC&S.

Commissioner Kiyosaki, referring back to Upcountry water report, looked at the dates in 2008. She expressed concern regarding the interim IFS that were set in 2008 where the figure in the first group was 5 to 10 mgd and if that in combination with what is under consideration now, those numbers would look different. Director Eng agreed, but said he didn't recall since that time if they experience as severe conditions in Wailoa Ditch as this.

Commissioner Fujiwara said one of the other alternative uses was activating the Hamakuapoko well in conjunction with HC&S taking water from the ditch and giving them the Hamakuapoko well. Director Eng referred back to 2006 when the County Council passed an ordinance that the two wells at Hamakuapoko cannot be utilized for human consumption, thus the wells have basically remained idle. Director Eng was not employed by the County at the time, but his experience with wells of similar contamination can be treated with granular activated carbon that removes all of those contaminants. It hasn't been brought up before the Council, but the County needs to reconsider those sources since they could provide over 1 mgd of potable water. Commissioner Fujiwara said he might have been mistaken and thought that Maui DWS was in talks with HC&S in trading waters regarding that. Mayor Tavares noted that she was on the Council at that time and trading water with HC&S was one of the alternatives discussed as the Council was deliberating what to do with the Hamakuapoko wells. Emotions ran very high and accusations were flying around and it got to a point where no facts and no treatments were going to convince the public that this water was going to be safe. So, the Council at the time said they just won't use them except during a drought, but there was some talk about trading but it did not have enough support.

Chair Thielen asked if Hamakuapoko well water was to be put in below the ditch it would then be carried for use only for irrigation and is it an option that's available now. Director Eng said that if

Wailoa Ditch experienced severe drought conditions, that is something that he would be in discussions with EMI about. This time, back in July 2008, EMI fortunately let the County take as much water as was need from Wailoa Ditch and treat it. Maui DWS does have an agreement that at 16 mgd (in Wailoa Ditch), Maui DWS and HC&S basically splits the water; however; HC&S allowed Maui DWS to take as much as the needed. It's still a possibility if the ditch goes down, Maui DWS would talk to EMI about pumping water into the Hamakua ditch to serve the Kula Agricultural Park. Chair Thielen asked if the Council resolution says the wells can't be used for drinking water, why wouldn't it be feasible for non-drinking use even without a drought. Director Eng said it's still expensive water to pump, so it would be very expensive irrigation water probably on the order of $1.50 per thousand gallons in electricity. Chair Thielen asked what that was comparable to. Director Eng replied that they charge $1.00 per thousand gallons for the Kula Agricultural Park.

Dr. Fukino asked what the impact of the CWRM recommendations on the agricultural waterline being constructed with the Department of Agriculture, where that water may be coming from, and whether the restrictions would impact its use. Director Eng said that is something that they always had concerns about, since during summers they see the Waikamoi Reservoirs dry up and the Kahakapao Reservoirs drop. The Kula dual line that's being constructed is going to take from those same reservoirs. If Maui DWS doesn't have enough water to treat for domestic purposes, how can they expect to even serve the farmers off that? Thus, the improvements of the Waikamoi Flume are going to be key.

Chair Thielen asked if the Commissioners were ready to enter deliberations or wanted to ask more questions of staff and others. They indicated that they had some questions for staff.

Recessed at 7:05 p.m.

Chair Laura Thielen called the meeting of the Commission on Water Resource Management back to order at 7:25 p.m.

Chair Thielen said that staff worked up a single page that lists all 19 streams. The sheet includes, for each stream, whether DAR recommended a return, what the minimum levels would be under the DAR recommendation, and the H_{90} levels under the DAR recommendation. The table is provided in Exhibit 2 if the Commission wants to take a look at the H_{50} as suggested by Maui County. Also, the sheet presents the minimum level recommended for the streams by CWRM and their H_{90} levels. The numbers on this table present the numbers being restored to the streams to meet the interim IFS, thus it is slightly different then the interim IFS. As was explained earlier, there may be some water already going downstream, so to get to a certain interim IFS there doesn't need to be restoration of the total amount because there's already some water there.

Chair Thielen said she knows there's going to be debate on whether the Commissioners agree on how staff came up with the numbers, but just let the staff (DAR and CWRM) present the basis for their numbers. Once the Commission understands their numbers, then they can add in what the parties have presented, and then they can go into deliberations and can debate amongst themselves whether they agree or disagree.

Minutes

Staff Presentation:

Chui Ling Cheng explained that what was distributed was the restoration amounts, the amount of flow that needs to be restored to reach a specific flow recommended by DAR and CWRM. In the left column are the numbers for the nine streams that DAR had recommended for the wet and dry season. In the rightmost column (the column with handwriting) is the minimum flow needed in the wet and dry season under the CWRM recommendation, for which numbers are available for six of the streams. Chair Thielen clarified Ms. Cheng's statement that the CWRM recommendation was for the minimum restoration needed to achieve the instream flow standard.

Glenn Higashi explained that they came up with their numbers by doing stream surveys and actually hiking the streams and hitting certain areas. Based on streamflow information from USGS, they were able to use the flow duration curves for the lower areas which were actually lower than what would be released from the upper area. The upper area had long term gages so it was based on actual long term data, whereas the lower sections were based on flow estimations that took into account losses as well as increases of the stream flow. Looking back at how CWRM approached their calculation, they were looking at release of water in areas which were below the gage and if they had known that, then the DAR numbers would have matched more with CWRM's numbers. DAR did not know where CWRM planned to monitor, thus did not take that into consideration.

Chair Thielen asked Mr. Higashi to explain that they worked with a consultant, Jim Parham, and had a conference call with CWRM staff, DAR staff, and herself on Friday, in which Mr. Parham explained the difference and why the recommendation for dry season, at that point, he acknowledged to be less than 20-percent of the median base flow. Even with that knowledge, he still recommended that level. Mr. Higashi agreed in those areas that were less than 20-percent DAR considered gains based on the flow estimates. DAR considered the bare minimum that would be needed to meet the 20-percent. There would be dry areas from the upper diversion to somewhere downstream, and in order to put water back in the stream and have a wetted pathway throughout the whole stream, there would need to be measurements along the entire stretch of the stream to find out where the gains and losses are. Rather, DAR used the flow estimates that were available to base their recommendation on. Bob Nishimoto noted that DAR's philosophy during this exercise was to 'share the pain'. In looking at any natural stream there are times when there are droughts and there's dry sections when the fish will wait out until the next rainfall. In DAR's consideration, they do realize that there will be dry sections and of course they would like to have the full H_{90}, but this situation does conform to what the animal do experience in nature.

Chair Theilen then asked CWRM staff to explain their numbers.

Ms. Cheng said DAR explained partly how they arrived at their numbers and the only difference is that DAR is monitoring and looking at the lower reach. CWRM staff actually went out on a site visit and scouted potential monitoring locations and they are mostly near the Hana Highway right below the diversion. Those sections were usually dry and it's more accessible near locations near Hana Highway for each of the streams. CWRM staff took DAR's position in restoring 64-percent of restoring the natural median baseflow in the wet season and used the flow measurements near the gaging station near the monitoring location. It just so happens that all the (interim IFS) monitoring points are near continuous USGS stream gages (i.e., instead of

estimated flows they are recorded streamflow gages). For all of the five DAR priority streams that CWRM is recommending all those numbers are based on USGS stream gages. So for the wet season, staff took 64-percent of whatever flow was recorded as the natural median baseflow near the monitoring location, and for the dry season staff used 20-percent. That's also to make sure that in the wet season there is sufficient flow to maintain H_{90}, habitat at 90-percent, for the dry reaches as well, and in the wet season by taking 20-percent staff is making sure there is minimum connectivity, or C_{min}, in the dry reach right below the diversion as well.

Chair Thielen reviewed what her understanding was. What DAR recommended was to say when you take a look at habitat for life in the streams what you ideally would like is to have not just recruitment but also reproduction and growth. In a wet season, you could do a restore at a level that DAR feels the minimum to have reproduction; growth and recruitment would be the H_{90}, or 64-percent of the median baseflow. In the dry season, by having minimum conductivity, you could have recruitment and survival for the species to basically lay over til the wet season and that the DAR recommendation is that 20-percent of the median baseflow is the minimum needed for connectivity. However, according to the conference call with Jim Parham, for a short stretch in the stream you could do with less than 20-percent so that the amounts under the DAR restoration levels immediately below the diversions are actually less than 20-percent because the water will go a short distance and then hit gaining reaches to where the flow will get to 20-percent. CWRM, in contrast, said let's just start at the 20-percent and the 64-percent right below the diversion, so that when the water gets down to the gaining reaches, the flow is actually above the 20-percent and the 64-percent after the stream gains. So, when talking about it in a layperson analogy, DAR is looking at the dry season perhaps like having a thin line (or trail) between a town makai and a town mauka, whereas in the CWRM number there would be something more robust, and in the wet season there'd be little towns and villages along the way where animals can recruit, reproduce and grow. The two ends of the spectrum goes from what DAR feels is the bare minimum along the lines of 'share the pain' philosophy, while the CWRM numbers would be a more robust model for habitat restoration.

Dr. Fukino asked for clarification where even though the CWRM numbers appear lower, there would be a wider path of water because of where the flow started. Chair Thielen affirmed that the CWRM numbers would occur immediately below the diversion and as it went downstream more water would be gained, so it would above the minimum flow. Both ways of looking at it have merit.

Dr. Miike asked DAR if they had known what CWRM was doing, and in the wet season, would they use their numbers? DAR agreed that they would. Dr. Miike confirmed then that in the wet season there is no difference. He continued that in the dry season, when DAR said they were using 20-percent or less, it may also mean that there would be dry stretches and DAR's rational is that there are streams that have dry stretches and then when it rains the animals recruit. But under normal conditions, these streams were not like that. So, when we say that there is a wetted perimeter all the way up and down but DAR says that's not really so, the numbers were provided because DAR expects to have some dry stretches. Dr. Nishimoto agreed and said that this was during the dry season, and again their philosophy was to share the pain. Dr. Miike asked for clarification in who's sharing the pain. Dr. Nishimoto stated that DAR's intent was to share the pain with the offstream users and to be fair.

Chair Thielen noted that the discussion should be held until the Commission deliberations and that questions were to just understand the numbers.

Dr. Miike said so far it's been presented as wet season/dry season and the two basic choices are wet season all year around, or split wet and dry. However, do we have to have all the streams in dry season flow? Dr. Miike said it seems to him that the stream with the most concerns with Waikamoi, so if the Commission entertain a wet or dry season flow, it doesn't have to be an all or nothing approach? Dr. Nishimoto agreed. Chair Thielen asked for clarification. Dr. Miike explained that one of the other choices, if they do a wet/dry flow, is to have a wet season flow for all five streams except for Waikamoi, and instead have a dry season flow for Waikamoi. Or any combination thereof.

Commissioner Balfour said he would like to see the proposed flow amounts in mgd (million gallons per day) rather than cfs (cubic feet per second), for all streams.

Chair Thielen noted that DAR had provided their guiding principles and asked Dr. Nishimoto to present those principles as it would be helpful to hear about those in making choices and what would be valuable. Dr. Nishimoto said that the 'share the pain' philosophy is one that they've considered and what's important is that, regardless of the Commission's decision, they would prefer to have streams completely restored to the H_{90} level, and to have at least one good one rather than many suboptimal ones. The concept they've worked on is that no stream has a unique assemblage of animals. The streams are all related, so if there are a couple of good streams that are producers, the eggs will be out there and the babies will return to whatever stream is around. There are streams that are good sources and DAR would like to maintain those. DAR would also like to recommend a serious monitoring protocol to determine whether it's really working or not and be able to make adaptive management decisions. DAR has talked with CWRM staff, and this is such an important decision that it's important that all parties come to the table and be honest about whether these efforts are really working or not.

Chair Thielen asked if it was fair to say that from the DAR's perspective would they rather have fewer streams restored at H_{90}, rather than more streams restored at H_{50}. Dr. Nishimoto agreed. He continued that DAR proposed restoration for nine stream, but instead got four or five. DAR has been backing down a lot and they stand for the animals, but they understand the plea of the offstreams users and so that's why they took that the approach they did. Philosophically, they want to be part of the solution. Chair Thielen said, in reference to the conference call with Mr. Parham, that there was some discussion about variation between restoration levels and whether it's better to have variations in restoration or whether restoration should be consistent across the streams, where a consistent restoration approach would provide a sampling to be able to see whether restoration is having the impact that DAR is estimating. Chair Thielen asked Dr. Nishimoto to clarify for the Commissioners. Dr. Nishimoto reiterated that DAR's preference is to have H_{90}. For example, instead of having four streams at H_{70}, they would rather have one at H_{90}.

Commissioner Fujiwara asked DAR to explain the difference between H_{70} and H_{90}. Mr. Higashi said that H_{90} is what DAR feels is the bare minimum for the animals to do all their biofunctions which is to grow, spawn, etc. This is backed up by DAR's 20 years and more of experience in the stream where they find animals and their database that has over 90,000 animal observations.

They're finding that the animals do require a certain depth to actually carry on these functions. Commissioner Fujiwara asked then is it no use having streamflow at H_{70} or H_{50}. Mr. Higashi reiterated that DAR feels H_{90} is the bare minimum that they could live with.

Dr. Fukino asked what DAR's thoughts were on the CWRM recommendations regarding the streams used to convey water, and because there is a lot of water in those conveying streams, is there an increase in flora and fauna that you expect to see because there is more water in these streams? Mr. Higashi said yes, that more water means basically more available habitat for the animals. DAR's ranking was based on habitat units, which reflected how much habitat would increase with increases to streamflow. DAR also looked at how the water would be put back into the streams, thus looked at diversions. One of the issues that they've seen with the diversions is that if water is released through a sluice gate, it will put more water into the stream downstream, but it will not necessarily enable the animals to pass the diversion and go upstream. The diversions are areas where the water runs into a ditch and the fish coming up may not be able to climb up because the flow coming out of the sluice gate may be too strong. Mr. Higashi also said the other problem is issue of entrainment. Hawaii stream animals are amphidromous, where they lay their eggs in the stream and when the eggs hatch, the larvae gets washed out to the ocean, they go into the plankton for a couple of months and then they come back and recruit into the stream. When these animals are in the stream and reproducing, the spawn hatches and if there's a ditch or diversion, these fish are conveyed into the irrigation system and are gone. DAR recognizes that the solutions will require engineering and will need to be looked at to allow fish passage up and down the stream.

Commissioner Kiyosaki wanted to make sure she understood the DAR recommendation on the dry season for the restoration amounts, so basically the streams are being maintained in the lower reaches. Waikamoi, for instance, it says zero so there won't be any additional release for Waikamoi but downstream there will be flow because it's a gaining stream. As opposed to the CWRM recommendation that is restoring 1.1 mgd, so there might be 2 to 3 downstream. Chair Thielen clarified that Waikamoi is the one exception because water is actually conveyed through there and that's why it's zero. Rather, for the streams where it's dry immediately below the diversion, the DAR recommendation is 0.06 mgd downstream of the diversion. Looking at another example, Commissioner Kiyosaki noted that for East Wailuaiki DAR's recommendation is 0.2 mgd. So, is DAR expertise saying that that flow would allow for native species to wait through the dry season and then still migrate during the wet season? Mr. Higashi agreed. He then noted that what DAR did find out later on, was the HC&S uses certain streams for conveyance and that the ditch system may harbor invasive species. DAR would prefer not to see streams being restored through ditch systems, because that may introduce invasive species into other watersheds. This, for example, was not considered when the data was first presented and may have played into the final selection of streams.

Chair Thielen then asked if DAR understood why CWRM staff recommended fewer streams restored. Mr. Higashi agreed that they did not want to see streams restored where the two points of conveyance are far apart because it may not be feasible to overcome the conveyance.

Chair Thielen said that on the list of the 19 streams, the conveyance streams that DAR had originally looked at without knowing it are #4, #5, #12 and #13. Dr. Nishimoto reminded the

Commissioners that the greatest threat to the native species besides lack of water, are guppies. Guppies are intermediary host for parasites that the carry to native goby populations.

Commissioner Kiyosaki noted that Dr. Nishimoto indicated it was more important to have a healthy stream in an area, and that there could be migration from the healthy stream to other streams in the area. Did DAR like geographic diversity or separation? Dr. Nishimoto agreed. However, Commissioner Kiyosaki noted that there are a lot of streams clustered together that are targeted for restoration. Dr. Nishimoto that DAR made a recommendation to CWRM staff and they took into account CWRM's considerations, but they did the best they could.

Dr. Miike asked for clarification from DAR that if they agree with CWRM on the annual wet season numbers, but on the dry season even though DAR didn't realize where CWRM was using the upper reaches, they didn't say they agree with CWRM but rather they came up with different numbers which were smaller. If the reason was that DAR's consultant said it would be okay that there would be connectivity, why was it okay that in one case they accept CWRM's wet season, but not the dry season. Mr. Uyeno noted that at the time when data was asked for from all parties, CWRM worked with DAR and USGS to gain a better understanding of hydrology. It was at that time CWRM identified its monitoring locations and DAR did not have that information. Mr. Higashi further clarified that when Mr. Parham ran the model to develop the DAR recommendation he was unaware of CWRM's monitoring location. Now knowing where CWRM intends to monitor, DAR agrees with the CWRM staff dry season flows as well.

Chair Thielen asked for further clarification from DAR, what was the understanding between DAR's consultant. Mr. Parham indicated that he was aware that it was dry below the diversions and because it's gaining streams, the consultant said the nominal amount of water released immediately below the diversion, even though it is less than 20-percent of the median base flow, that because it was for a short length and would then hit gaining reaches it was okay. He also acknowledged that CWRM numbers was another legitimate way of calculating that, but they're different numbers as far as restoration. Bob Nishimoto stated that they stand by their consultant's recommendation. Chair Thielen noted that she was confused on the differences as well, but after talking to Mr. Parham he clarified the DAR recommended flows. Dr. Miike asked if he heard correctly that DAR's consultant was okay with CWRM's numbers. DAR agreed. Chair Thielen stated that it was up to the Commission to decide, but that both methods are accurate and viable ways of doing it. Dr. Nishimoto noted that their consultant made a recommendation not knowing where the data was coming from, but he did mention that either approach was okay.

Dr. Miike asked about guppies and swordtails that for those areas where the streams are used for conveyance, aren't they in pretty isolated areas far from where they can't get introduced. Bob Nishimoto responded yes, but he has seen many situations where there is still that false sense that mosquito fish will control mosquitoes. He also recognized that DAR has not surveyed the conveyed sections of stream.

Dr. Fukino said there was a comment made by HC&S that they were opposing a standard for west Wailuaiki and not opposing east Wailuaiki. She asked what the relationship was between the two in terms of flora and fauna, so that if an IFS were set for one and not the other. Glenn Higashi said one thing being considered is that the two are in the same watershed more or less

and that the two are really close together. Based on DAR's ranking, they found that the ranking that east Wailuaiki had habitat that was above average and west was fairly average. He didn't know why they would say that, but probably because the two streams are close together, but they feel it would be good habitat to be restored. Mr. Uyeno said his understanding was due to the geographic location and the fact that west Wailuaiki tends to produce more water. Dr. Fukino asked for clarification as to which stream had more habitats. Mr. Higashi said west had habitat that was above average, while east was average. Dr. Nishimoto further explained that both Wailuaiki streams are nice because they have estuaries. He noted that while this has not really been discussed, streams are not only passageways for amphidromous animals, but streams with long estuaries will attract of lot of important species such as mullet and aholehole, and have added value. Dr. Fukino noted that HC&S' request that there not be any water diverted in the dry season and if the Commission were to say there will be no water diverted during the dry season, would DAR know what the impact would be on the stream. Dr. Nishimoto noted that they have not looked at that, but reiterated that DAR has given up many streams in their prioritization.

Chui Ling Cheng asked for clarification from the DAR data submission on Waikamoi stream where there is zero flow as the amount of flow that needed to be restored. That's basically taking from their data submission which indicates a total return of negative .3. A negative flow can't be returned, so CWRM staff basically assumed that to be a no flow return but in the upper two diversions on Waikamoi streams (Wailoa and New Hamakua Ditches) DAR proposed a .1 cfs, or .06 mgd, restored, whereas in the lower diversion (Center Ditch) DAR proposed a -.4 cfs returned. Chui clarified if DAR was in fact asking for zero return or are they asking for .1 return.

Chair Thielen noted that this is rather confusing and would rather not get into it and DAR did not have an answer.

Mr. Uyeno, to clarify the issue on conveyance streams, reiterated that it was not staff's intention to restore more water into a stream than would naturally be occurring.

Chair Thielen noted that every 0.1 cfs is equivalent to 0.06 million gallons per day.

Chair Thielen reviewed that Maui DWS recommendation was zero restoration on Waikamoi. The HC&S recommendation was zero restoration on west Wailuaiki. NHLC was restoration for all the streams. Maui DWS recommended using the CWRM numbers, but starting at H_{50}. HC&S and NHLC, while they disagree on the number of streams and disagree with the seasonal vs. annual approaches, the CWRM numbers for the wet season were acceptable; and HC&S wanted zero restoration in the dry season. Maui DWS said the seasonal approach was better and supported the CWRM number for the dry season.

Deliberations:

1. Seasonal Restoration vs. Annual Restoration. Staff recommendation is seasonal for all streams except where there is taro farming in Makapipi and using an annual number there.
2. Which streams, if any, to order restoration: NHLC wants all the streams; DAR's initial list of streams; CWRM narrowing of that list to eliminate the streams that are used for conveyance; Maui DWS to eliminate Waikamoi; HC&S eliminate east Wailuaiki

3. At what levels to do restoration: what are the H (habitat) levels; the C (connectivity) levels, and then use CWRM numbers, DAR numbers or some other ones because they would have a big difference as far as the amounts of water to be restored to the stream from below the diversions

The staff presented three issues:
1. Seasonal versus annual interim IFS approach;
2. Streams recommended for seasonal or annual restoration, except Makapipi Stream; and
3. Habitat levels to restore to the streams in the wet (H_{min}) and dry (C_{min}) seasons.

Chair Thielen asked the Commissioners to state their preference on the interim IFS approach (seasonal versus annual). Commissioners Balfour, Fukino, Fujiwara, Kiyosaki, and Chair Thielen preferred the seasonal interim IFS approach. Commissioner Miike preferred the annual interim IFS approach.

The Chairperson suggested to narrow down the list of streams for Commission discussion, and reiterated the preferences of the various parties on which streams to focus.
- NHLC recommended flow restoration for all 19 east Maui streams.
- DAR recommended eight streams for possible flow restoration.
- CWRM staff proposed five of the DAR streams and added Makapipi Stream.
- Maui DWS requested no restoration for Waikamoi Stream because the County diverts from that stream.
- HC&S requested no restoration for West Wailuaiki Stream.

Commissioner Balfour suggested they discuss staff's recommendation for Makapipi Stream because the rationale for the restoration of flow to that stream is different from the other streams.

MOTION: Commissioner Balfour and Kiyosaki moved to support staff recommendation for Makapipi Stream.

Commissioner Miike said, "I think legally we're supposed to restore all the streams at the minimum at the H90 level; however, given the practicality of the situation, I'm fine with restoring some of them. But I think that my preference would have been for DAR. Still willing to accept CWRM's recommendation by my biggest problem is the seasonal variation."

Chair Thielen explained that staff recommended Makapipi Stream for annual flow restoration because the end use is taro farming which is not a seasonal need but a year-round need. The interim IFS recommendation is 0.60 mgd.

VOTE: Motion to support staff recommendation for Makapipi Stream - passed.

Commissioner Miike mentioned the staff recommendation for Hanawi Stream, in which an annual restoration of 0.10 cfs (0.06 mgd) for a wetted amount would benefit the resources.

MOTION: Commissioner Miike and Fujiwara moved to support staff recommendation for Hanawi Stream.

VOTE: Motion to support staff recommendation for Hanawi Stream - passed.

The Chairperson indicated an estimated total flow restoration of 0.66 mgd would result from adopting staff recommendations for Makapipi and Hanawi Streams. From the remaining 17 east Maui streams, Commissioner Miike preferred flow restoration in the eight DAR priority streams but would be willing to accept the five CWRM streams. Commissioner Miike clarified that he preferred flow restoration for all 19 streams, but would accept the DAR streams, and would be willing to entertain the CWRM streams.

Commissioner Balfour suggested revisiting Waikamoi Stream after the Waikamoi flume is fixed. On the other hand, Commissioner Fujiwara said that regardless of the Waikamoi flume, the main issue is establishing instream flow. He proposed to use the DAR flow numbers on the seasonal approach for Waikamoi Stream rather than the CWRM flow numbers. The Chairperson recapped that HC&S would support the CWRM recommendation, and that Maui DWS would support the CWRM flow numbers at the H50 habitat level. Below are the CWRM and DAR H90 flow numbers for the wet and dry seasons.

	Wet season	Dry season
CWRM	4.1 cfs / 2.65 mgd	1.1 cfs / 0.71 mgd
DAR	2.6 cfs / 1.68 mgd	0 flow

Commissioner Fukino indicated her support for the DAR numbers on Waikamoi Stream.

Commissioner Miike explained that water diverted from these streams was about 165 mgd and that quibbling between 10.3 mgd and 3.7 mgd to restore to the streams was not a balancing act. He said, “We want to so minimally harm the offstream users that we’re willing to minimally restore those streams.”

Chair Thielen reiterated that an abbreviated list of streams has been selected from all 19 streams, and whether that support would be contingent on certain habitat levels.
MOTION: Commissioner Miike moved to adopt H_{90} flow levels for all streams.
VOTE: Motion to adopt H90 flow levels for all streams – failed.

Commissioner Fujiwara and Kiyosaki preferred to look at the streams CWRM staff recommended for flow restoration. Commissioner Kiyosaki mentioned that East and West Waikuaiki streams had above average habitat conditions. The Chairperson added that DAR recommended those streams for flow restoration because DAR was looking for streams where there would be biological benefit from flow releases.

Commissioner Fukino in general supported CWRM streams.

Chair Thielen suggested narrowing down the list of streams to East and West Wailuaiki, Waikamoi, and Waiohue. Commissioner Balfour proposed to keep Waikamoi Stream but drop West Waikuaiki Stream. Commissioner Miike questioned the rationale behind the further narrowing of the list of streams for flow restoration because he thought that the streams were being evaluated individually as well as collectively. Chair Thielen responded that one of the concerns expressed in the testimony was the geographic concentration of the streams in one area.

This issue applied to these 19 streams and those that the Commission voted on in September of 2008.

The Chairperson asked the Commissioners their preference on the habitat levels of restoration, and whether to use DAR or CWRN flow numbers. She reminded the Commissioners that there was a difference between the DAR and CWRM numbers in the wet and dry seasons regarding the amount of flow restored, and that Maui DWS preferred H_{50} rather than H_{90} levels. Some Commissioners previously agreed on using CWRM numbers in the wet season. Commissioners Kiyosaki and Fujiwara preferred H_{90} habitat level.

Chair Thielen explained that the DAR flow numbers would provide minimum connectivity for stream biota; however, the CWRM staff also developed a viable method of calculating the dry season flow numbers. She recapped that HC&S recommended no restoration in the dry season, Maui DWS was only concerned with Waikamoi Stream, and NHLC recommended annual flow restoration.

Commissioner Fujiwara indicated that the DAR flow numbers were less. Commissioner Fukino proposed to use DAR flow numbers for Wakamoi for both wet and dry seasons. Commissioner Miike stated that DAR complied with CWRM flow numbers, and questioned which numbers the Commissioners were referring. Commissioner Fujiwara clarified that he supported DAR flow numbers for Waikamoi Stream in the wet and dry seasons.

Chair Thielen stated that DAR and HC&S stepped forward to offer a compromise, which is extremely rare. According to the DAR dry season flow numbers for the four streams (i.e., Waikamoi, West Wailuaiki, East Wailuaiki, and Waiohue), the bare minimum to provide for minimum connectivity would be zero for Waikamoi Stream, 0.40 cfs / 0.26 mgd for West Wailuaiki Stream, 0.20 cfs / 0.13 mgd for East Wailuaiki Stream, and 0.10 cfs / 0.06 mgd for Waiohue Stream. The total flow restoration amount would be about 0.45 mgd during the dry season. She added that the balance in the compromise would be using CWRM flow numbers for H_{90} and DAR flow numbers for C_{min} in the dry season, which would be very nominal, in the streams the Commissioners would select to restore.

Commissioner Balfour requested the staff to convert the flow restoration amounts for each of the four streams from cfs to mgd.

	CFS	MGD
Waikamoi	2.60	1.68
West Waikuaiki	3.80	2.46
East Waikuaiki	3.70	2.39
Waiohue	3.20	2.07

MOTION: Commissioner Balfour moved to accept staff recommendation for wet season and DAR recommendations for dry season for the four streams, Waikamoi, West Wailuaiki, East Wailuaiki, and Waiohue Streams.

Commissioner Fujiwara proposed to amend the motion to include DAR's recommendation for the wet season for Waikamoi Stream. Commissioner Balfour seconded the amended motion for Waikamoi Stream to use DAR recommendation for the wet and dry seasons.

VOTE: Commissioners Balfour, Fujiwara, Kiyosaki, Fukino, and Chair Thielen voted to accept the motion. Commissioner Miike voted against the motion.

Chair Thielen summarized that the Commission voted to restore flow to six (6) streams: two (2) streams on an annual basis and four (4) streams on a seasonal basis. Remaining were 13 streams.

MOTION: Commissioners Fujiwara and Balfour moved to accept status quo on the remaining 13 streams.

VOTE: Commissioners Balfour, Fujiwara, Kiyosaki, Fukino, and Chair Thielen voted to accept the motion. Commissioner Miike voted against the motion.

The staff submittal also included general recommendations on implementation (short-term, mid-term, and long-term actions), monitoring, evaluation, and reporting.

MOTION: Commissioner Miike and Fukino moved to accept staff recommendation on the general recommendations on implementation (short-term, mid-term, and long-term actions), monitoring, evaluation, and reporting.

VOTE: Motion passed unanimously.

Chair Thielen provided a brief summary of the Commission's decision. Flow restoration was recommended for six (6) streams. Annual flow restoration was recommended for two (2) of the streams - Hanawi and Makapipi Streams. Seasonal flow restoration was recommended for four (4) streams - Waikamoi, West Wailuaiki, East Wailuaiki, and Waiohue. Waikamoi Stream was recommended lower restoration amounts for both wet and dry seasons. The remaining three (3) streams were recommended lower restoration amounts in the dry season and higher restoration amounts in the wet season. The Commission also recommended additional requirements for Maui DWS in regards to repairing the Waikamoi Flume to reduce waste. The Commission recommended HC&S to begin updating their documentation of any system loss from the reservoirs, to report end use of the water annually to the Commission (specifically of any changes to the end use), and to develop a format of the report for Commission review no later than September 2010.

Alan Murakami of NHLC asked on behalf of his clients to protect their right for a contested case hearing, and would like an action on it. Chair Thielen announced the request for a contested case hearing, and asked Mr. Murakami to file a written request. The Attorney's General's office would advise the Commission on that matter and that the Commission would make a decision at a future meeting.

NOTE: A summary table of the east Maui interim instream flow standards, as approved by the Commission, are included as part of these minutes for reference.

E. NEXT COMMISSION MEETINGS (TENTATIVE)

1. June 16, 2010
2. July 21, 2010

Respectfully submitted,

KATHLEEN OSHIRO
Secretary

APPROVED AS SUBMITTED:

KEN C. KAWAHARA
Deputy Director

Summary of East Maui Interim Instream Flow Standards

This table provides a summary of the interim instream flow standards (Interim IFS) for 19 east Maui streams approved by the Commission on Water Resource Management at its May 25, 2010 meeting.

		Interim IFS Amounts				Restoration Amounts					
		Wet Season		Dry Season		Wet Season		Dry Season		Altitude	Notes on Interim IFS Location *(All interim IFS locations are located below all EMI diversions)*
		cfs	*mgd*	*cfs*	*mgd*	*cfs*	*mgd*	*cfs*	*mgd*	*feet*	
1	Waikamoi	2.80	1.81	0	0	2.60	1.68	0	0	550	Just above Hana Highway.
2	Alo	--	--	--	--	--	--	--	--	--	One measurable interim IFS established for Waikamoi Stream below the confluence with Alo Stream.
3	Wahinepee	0.50	0.32	*(Annual)*		--	--	--	--	575	Just above Hana Highway, as designated on October 8, 1988.
4	Puohokamoa	0.40	0.26	*(Annual)*		--	--	--	--	565	Just above Hana Highway, as designated on October 8, 1988.
5	Haipuaena	0.10	0.06	*(Annual)*		--	--	--	--	510	Just above Hana Highway, as designated on October 8, 1988.
6	Punalau/Kolea	0.20	0.13	*(Annual)*		--	--	--	--	40	Just above Hana Highway, as designated on October 8, 1988.
7	Honomanu	0	0	*(Annual)*		--	--	--	--	20	Just above Hana Highway, as designated on October 8, 1988.
8	Nuaailua	3.10	2.00	*(Annual)*		--	--	--	--	110	Just above Hana Highway, as designated on October 8, 1988.
9	Ohia (Waianu)	4.60	2.97	*(Annual)*		--	--	--	--	195	Just above Hana Highway, as designated on October 8, 1988.
10	West Wailuaiki	3.80	2.46	0.40	0.26	3.80	2.46	0.40	0.26	1,235	Just above Hana Highway.
11	East Wailuaiki	3.70	2.39	0.20	0.13	3.70	2.39	0.20	0.13	1,235	Just above Hana Highway.
12	Kopiliula	0.50	0.32	*(Annual)*		--	--	--	--	1,270	Just above Hana Highway, as designated on October 8, 1988.
13	Puakaa	0.60	0.39	*(Annual)*		--	--	--	--	1,235	Just above Hana Highway, as designated on October 8, 1988.
14	Waiohue	3.20	2.07	0.10	0.06	3.2	2.07	0.10	0.06	1,195	Just above Hana Highway.
15	Paakea	1.50	0.97	*(Annual)*		--	--	--	--	1,265	Just above Hana Highway, as designated on October 8, 1988.
16	Waiaaka	0	0	*(Annual)*		--	--	--	--	1,235	At Hana Highway, as designated on October 8, 1988.
17	Kapaula	0.20	0.13	*(Annual)*		--	--	--	--	1,194	Just above Hana Highway, as designated on October 8, 1988.
18	Hanawi	0.10	0.06	*(Annual)*		0.10	0.06	*(Annual)*		1,315	Below EMI's main Hanawi diversion (Intake K-3).
19	Makapipi	0.93	0.60	*(Annual)*		0.93	0.60	*(Annual)*		935	Just above Hana Highway.