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Ref: Mahukona Designation.sub

STAFF SUBMITTAL

for the meeting of the
COMMISSION ON WATER RESOURCE MANAGEMENT

February 15, 2006
Honolulu, Oahu

PETITION FOR GROUND WATER MANAGEMENT DESIGNATION
Mahukona Aquifer System Area, Kohala Aquifer Sector Area
Island of Hawaii

PETITIONER:

North-South Kohala Boundary Water Group
59-148 Olomana Road
Kamuela, HI 96743

SUMMARY OF REQUEST:

The petitioner requests to designate the Mahukona Aquifer System Area as a Ground Water Management Area due to uncertainties in sustainable yield and future demand. The petition and accompanying report by Kelly Pomeroy are attached as Exhibit 1.

BACKGROUND:

The Mahukona Aquifer System Area is in the eastern Kohala region on the north side of the Big Island within the Kohala Aquifer Sector Area (refer to Exhibit 2). The current sustainable yield, established under the Commission's Water Resources Protection Plan (WRPP Draft, March 1992), is 17 million gallons per day (mgd). The area of more detailed concern within the petition and the system area are shown in Exhibit 3.

On December 12, 2005, the Commission received a petition to designate the Mahukona Aquifer System Area as a Ground Water Management Area, as well as an accompanying report entitled "An Evaluation of Water Resources In The Kohala Ranch Area" (refer to Exhibit 1).

On December 20, 2005, CWRM sent letters to the County Council, Mayor, and Department of Water Supply to solicit comments on the petition.

PROCESS OF DESIGNATION:

The process to designate a ground water management area is described under the State Water Code, Chapter 174C Part IV, Hawaii Revised Statutes, and Chapter 171, Subchapter 2, Hawaii Administrative Rules. The process is described below, with a description of events specific to this application following.

1. **The initiation of the designation procedure may be made by the chairperson (13-171-3, HAR) or by petition (13-171-4, HAR).** This request was initiated by petition.
2. **Staff is then required to consult with the county mayor and county water board (13-171-4(a), HAR).** On December 20, 2005, staff sent a copy of the petition and supporting documents to the Hawaii County's Mayor's office, the Hawaii Department of Water Supply, and the Hawaii County Council requesting comments on the designation request. Comments were due on January 20, 2006.
3. **Within 60 days after receipt of the petition, the chairperson must make a recommendation to the Commission for continuance of the process for designation (13-171-4, HAR).** The 60-day deadline is February 10, 2006. In accordance with these rules, the chairperson is making the recommendation on the date of the public notice and availability of this submittal for public review (February 9, 2006). Subsequent action from the Commission on this recommendation for continuance is on February 15, 2006, the date of this Commission meeting.
4. **If the Commission accepts a recommendation to continue entertaining the petition, then:**
 - A) **a public hearing will be held in the Waimea/Kohala area on the Big Island. Public notices regarding the hearing will be published once a week for three successive weeks, and the last public notice shall not be less than ten days nor more than thirty days before the date set for the hearing. (13-171-5, HAR).**
 - B) **The Commission shall then consult once again with the County Council, Department of Water Supply and Mayor and conduct necessary investigations and prepare a findings of fact report. Upon completion of these items, the Chairperson shall make a recommendation to the Commission for or against designation. (13-171-9, HAR).**

If the Commission does not accept a recommendation to continue or accepts a recommendation to deny the petition, then the process ends.

PETITION AND REPORT SUMMARY AND ANALYSIS:

In the report, Ms. Pomeroy covers 3 main issues: 1) Mahukona water availability; 2) Kohala Ranch Development Company (KRDC) demands; and 3) water management area boundaries. Staff addresses these in the following sections.

Water availability

It is not clear from the petition what the proposed new sustainable yield is or what area it applies to other than both appear to be less than the current sustainable yield and the hydrologic unit area recognized by the CWRM. The CWRM's WRPP estimates that the sustainable yield for the Mahukona Aquifer System Area is 17 mgd based on the analytical RAM model, which is not a firm number given the limited data that exists for the area. The report entitled "An Evaluation of Water Resources in the Kohala Ranch Area" refers to a number of reports and personal communications staff has not had time to review or verify, but suggests, in summary that "there probably is significantly less groundwater than claimed; possibly only half as much." It's not clear whether or not this is for a smaller area within the Mahukona Aquifer System Area. Assuming this statement applies system wide, the sustainable yield for the Mahukona Aquifer System Area could be, for the purposes of this analysis, as low as 8 mgd.

Water Demand

Current water demand conditions in the hydrologic unit are very low under current well infrastructure and existing end users. Currently, there are a total of 38 wells in the Mahukona Aquifer System Area (refer to Exhibit 4), which include Kohala Ranch sources. Of these, 3 are abandoned and sealed, 2 are used for observation, 5 are small diameter test holes and 12 are unused. For the remainder of the 16 wells, their pump capacities, assuming the pumps run for 24 hours a day, would limit the current maximum withdrawal possible from this aquifer to 3.56 mgd. This includes 3 of the 4 Kohala Ranch wells (Kohala Ranch Well 4, state well no. 6649-02 has no pump installed). 3.56 mgd is 45% of the conservative 8 mgd sustainable yield suggested by the petition. Actual reported pumpage for Mahukona is 0.691 mgd, based on a 12-month moving average on October of 2005 (refer to Exhibit 5).

Future water demand scenarios are not as clear as a range of possibilities exist. Staff also looks to the County's Water Use and Development Plan for guidance and the information contained therein estimates a total future demand for all projects served by the Kohala Ranch wells of 4.516 mgd (February 1992). Staff was hoping to receive updated comments from the County of Hawaii's Planning Department via the Mayor's office regarding use demand estimates, but as of the date of this submittal writing staff has not received any written comments. However, staff has spoken to representatives from the Planning Department and Department of Water Supply and anticipate receiving written comments by the date of the Commission meeting. The issues would include water availability as a prerequisite to subdivision approval, which the various developers have obtained. Projected water demands should be updated in the Hawaii County's Water Use and Development Plan, which is currently in the process of being completed.

Staff has consulted with KRDC, who indicates that 123 of the 477 lots in KRDC Phases I, II and III are occupied. The number of lots occupied on other projects KRDC serves has not been expressed by KRDC.

Staff has consulted with Bill Moore of KRDC, who estimates that total build out demand could now be on the order of 4.0 mgd, which staff feels can be considered a more reasonable quantity to estimate future demand for KRDC at this time.

Staff has reviewed Appendix III of the petition report, which indicates projected demands for the various projects served by the KRDC system. The duties vary for these projects, between minimum and maximum values, and for different uses, resulting in a future demand ranging between 4.952 to 7.353 mgd. Table 15, the Domestic Consumption Guideline of the Water System Standards of the Departments of Water Supply (2002) (shown in Exhibit 6), indicates that for planning purposes, residential demand for single family or duplex homes is 400 gallons per unit per day. Appendix III of the petition indicates Phase IV single family home duties of between 1200 and 2000 gallons per unit per day, which is much higher than Table 15. Given the current available information on actual use per lot, staff cannot evaluate the validity of demands predicted by the petition or actual existing use.

Following is a summary of the percentages of sustainable yield, based on different estimate projections and different sustainable yields:

Table 1: Summary of demand scenarios

Situation	Demand (mgd)	Current Sustainable Yield (mgd)	Percentage of current Sustainable Yield	Petition Sustainable Yield (mgd)	Percentage of adjusted Sustainable Yield
Current pumpage	0.691	17	4%	8	9%
Maximum possible pumpage based on current installed pump capacities	3.560	17	21%	8	45%
Demand based on 92 draft Hawaii Water Use and Development Plan	4.516	17	27%	8	56%
Petition estimated demand (min. including brackish)	4.952	17	29%	8	62%
Petition estimated demand (max. including brackish)	7.353	17	43%	8	92%
KRDC estimated build out demand (including brackish)	4	17	24%	8	50%

Water Management Area Boundaries

The third issue to address is the petitioner's contention that the Commission should act upon a hydrologic unit smaller than the established ground water hydrologic unit, which is the aquifer *system area*. Part III of the State Water Code requires that the Commission prepare a Hawaii Water Plan which "*shall divide each county into sections which shall each conform as nearly as practicable to a hydrologic unit*" (174C-31(e) HRS); and "*within each hydrologic unit, the Commission shall establish sustainable yield.*" (174C-31(e)(2) HRS). Therefore, the hydrologic unit that the Commission currently regulates is the Aquifer System Area. Designation would need to occur for the entire Aquifer System Area, not just the region below Kohala Ranch.

The petitioner justifies using a smaller area because the system area is not optimized, which is one of the assumptions of the current sustainable yield. Localized effects between existing and new wells on pumpage are currently addressed via the Well Construction/Pump Installation Permitting Process, and additionally managed at the local level by the Waimea Water Round Table. The Well Construction and Pump Installation Permit requires that well owners build and conduct pump tests in accordance with the Hawaii Well Construction and Pump Installation Standards. Results of these pump tests indicate to staff potential adverse effects related to drawdown and chloride increases to their own well as well as adjacent wells. Additionally, the Waimea Water Round Table (WWRT) was established to provide a local community based venue to address local issues of water management. Staff understands that the petitioners have never participated in the WWRT forum.

As a final note, earlier petitions to designate Lanai, Molokai, Iao (Maui) and Waihee (Maui) and updates to Pearl Harbor and Kualapuu (Molokai) Aquifer System Areas, used well optimization issues to try to redefine sustainable yield. Without a standardized acceptable numerical model staff has always recommended against defining sustainable yield on infrastructure limitations, which staff has referred to as "safe yield" in the past. Sustainable yield is the best estimate for the entire aquifer assuming optimized development takes place. Unfortunately, spatial variations and data are not known until wells are drilled, tested, and operated over time. This data in turn provides information that could be used to develop and calibrate numerical models to include infrastructure limitations on sustainable yield, as has happened in Pearl Harbor, Kualapuu, and may occur for Iao. Staff has not seen written copies of the numerical model reports the petition refers to.

CRITERIA FOR DESIGNATION:

Item 4 B) under the Process For Designation above describes investigations necessary to make a recommendation to the Commission. Part of the investigation is described under 13-171-7 HAR, Ground water criteria for designation. Under this rule, in designating an area for ground water use regulation, the following must be considered (a preliminary analysis follows each section):

- (1) **Whether an increase in water use or authorized planned use may cause the maximum rate of withdrawal from the ground water source to reach ninety percent of the sustainable yield of the proposed water management area;**

Staff agrees that the sustainable yield currently established is subject to further refinement and appreciates the petitioner's work to highlight recent studies and opinions regarding the estimate of sustainable yield for this area. However, the only scenario that exceeds 90% of sustainable yield in Table 1 is based on a maximum demand per unit, and the assumption that sustainable yield will be half of the current estimate. Because the actual demand should likely be somewhere in the range between the maximum and minimum demands and the sustainable yield is likely to be between one half and the current estimate, the likely increase in water use or authorized planned use would not achieve the 90% criterion.

The issue of sustainable yield is one that may be more appropriately addressed by the Commission's Water Resource Protection Plan, which is scheduled to have an updated draft by June 2006. Further, the estimate of sustainable yield should be completed *prior* to determining whether or not the 90% criterion is reached.

Therefore, given the best information available it would appear that this criterion is not met at this time.

- (2) **That the rates, times, spatial patterns, or depths of existing withdrawals of ground water are endangering the stability or optimum development of the ground water body due to upconing or encroachment of salt water;** Because there are no other users reporting chlorides in the Mahukona Aquifer System Area, effects of the Kohala Ranch 1 and 2 Wells (Well Nos. 6549-01 & -02) are unknown. The chlorides indicated by KRDC's reporting show no increases in chloride trends despite increases in pumpage since 1994, but show fluctuations between 72 and 90 mg/l (as shown in Exhibit 7) from existing pumpage. However, if future withdrawals were all concentrated within the existing KRDC wells then this could create localized upconing or chloride problems in the future. Bill Moore from KRDC has indicated that more wells may be drilled to help alleviate this situation but there are no firm plans at this point.

Therefore, given the best information available, this criterion is not met at this time.

- (3) **That the chloride contents of existing wells are increasing to levels which materially reduce the value of their existing uses;** Again, despite increases in pumpage since 1994, the chlorides indicated by KRDC's reporting show no increases in chloride trends, which remain steady and fluctuate between 72 and 90 mg/l. Therefore, given the best information available, this criterion is not met at this time.
- (4) **Whether excessive preventable waste of water is occurring;** Staff is unaware of excessive preventable waste at this time. Therefore, given the best information available, this criterion is not met at this time.

- (5) **There is an actual or threatened water quality degradation as determined by the department of health;** Staff has consulted with the Department of Health's Safe Drinking Water Branch, who do not identify any actual or threatened water quality degradation at this time. Therefore, given the best information available, this criterion is not met at this time.
- (6) **Serious disputes respecting the use of ground water resources are occurring;** There have been past disputes over placement of wells in the adjacent Waimea Aquifer System Area. The Waimea Round Table was formed to address these issues, and to date staff has not been aware of groundwater disputes since the formation of the Waimea Round Table. Therefore, given the best information available, this criterion is not met at this time.
- (7) **Whether regulation is necessary to preserve the diminishing ground water supply for future needs, as evidenced by excessively declining ground water levels;** Staff is unaware of excessively declining ground water levels in the Mahukona area. KRDC is currently not reporting water levels in the Kohala Ranch 1 & 2 Wells (Well Nos. 6549-01 and -02). Therefore, given the best information available, this criterion is not met at this time.
- (8) **Whether water development projects that have received any federal, state, or county approval may result, in the opinion of the commission, in one of the above conditions.** Aside from existing wells, staff is not aware of any new water development projects that have received approvals. However, according to KRDC, there may be additional wells developed which would require permits from the Commission in the future. Therefore there are no approved projects that would trigger any one of the previous conditions at this time.

Staff is recommending that the Commission deny the continuance of the petition for designation, based on staff's preliminary investigation into the eight criteria for designation described above. However, based on the petitioner's attached report, staff recognizes that the Commission may find it helpful to allow the continuance of the petition in order to obtain more information that may be useful in helping to revise the quantities for sustainable yield and future demands. Staff is planning to have an updated draft of the Water Resources Protection Plan ready by June 2006. It would be helpful if the County would update the 1992 projections for this area as well. It would be more productive to concentrate staff efforts in including these new studies into the WRPP sustainable yield update and County water demand estimates for the Mahukona Aquifer System Area than pursue such information through the designation process. Further, the merits of the petition regarding the 90% criterion of sustainable yield would be more conclusive with a better estimate of sustainable yield and updated demand information from the County.

COMMENTS FROM THE MAYOR'S OFFICE, COUNTY COUNCIL AND DEPARTMENT OF WATER SUPPLY:

As part of the designation process, staff solicited comments from the Mayor's Office, County Council and Department of Water Supply. Staff requested comments to be returned on January 20, 2006. To date, comments have not been received by any of these agencies. Staff understands that comments are being prepared by the County Planning Department and Department of Water Supply and should be received by the date of the Commission meeting.

ADDITIONAL COMMENTS:

Staff has also received comments from the Conveners of the Waimea Water Round Table (WWRT) on January 25, 2006, and KRDC on January 30, 2006. These are attached as Exhibits 8 and 9, respectively.

In summary, the WWRT are requesting denial of the petition for designation, based on the ability of the WWRT to manage ground water resources via the forum for concerned parties and the resource is not threatened at this time as defined by the designation criteria. The WWRT's participants include not only landowners/stakeholders, but also CWRM Commissioners, staff, and the Manager of the Department of Water Supply. Staff has consulted with Steve Bowles, a convener of the WWRT, who stated that the petitioner has never asked to participate in the WWRT, nor have any interested parties been turned away from the WWRT.

KRDC is requesting denial of the petition based on: a) the CWRM's ability to manage adverse pumping impacts via the Well Construction and Pump Installation Permits; and b) the County of Hawaii's previous subdivision approval which requires that subdivision water improvements meet County Standards.

RECOMMENDATION:

Staff recommends that:

- A) The Chairperson recommends that the Commission deny the continuance of the petition for the Ground Water Designation of Mahukona Aquifer System Area as a Ground Water Management Area.

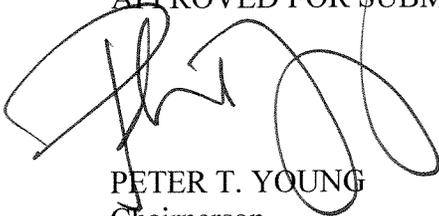
- B) The official studies cited in the petition shall be considered in the next Water Resources Protection Plan update, the draft of which is scheduled for June 2006.

Respectfully submitted,


for DEAN A. NAKANO
Acting Deputy Director

- Exhibit(s):
- 1 (Petition and Report)
 - 2 (Aquifer Boundary Map)
 - 3 (Kohala Ranch Wells)
 - 4 (Well Database)
 - 5 (12-MAV)
 - 6 (Table 15 - Domestic Consumption Guideline)
 - 7 (Kohala Pumpage and Chlorides)
 - 8 (Comments from Conveners of the Waimea Water Round Table)
 - 9 (Comments from Kohala Ranch)

APPROVED FOR SUBMITTAL:


PETER T. YOUNG
Chairperson