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**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA**

In the matter of:

HIGH DESERT POWER PROJECT

Docket No. 97-AFC-01C

**REPLY OF HIGH DESERT POWER PROJECT, LLC
TO CALIFORNIA ENERGY COMMISSION STAFF'S ANALYSIS OF THE
HIGH DESERT POWER PLANT RECYCLED WATER FEASIBILITY REPORT
DATED OCTOBER 9, 2015**

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HIGH DESERT POWER PROJECT, LLC
Docket No. 97-AFC-01C

Reply of High Desert Power Project, LLC to
California Energy Commission Staff's
Analysis of the High Desert Power Plant Recycled Water Feasibility Report
dated October 9, 2015

High Desert Power Project, LLC (“HDPP”) operates the High Desert Power Project (the “Facility”), an 830-megawatt (“MW”) combined-cycle power plant located in the City of Victorville within San Bernardino County. In 2008, HDPP petitioned the Energy Commission requesting approval to use recycled water for cooling purposes to the extent the Facility’s existing water treatment system could treat recycled water. At that time, HDPP estimated the Facility could use and treat approximately 33% recycled water when it was blended with State Water Project water (“SWP Water”). In 2009, the Energy Commission approved HDPP’s petition. As part of the approval, the Energy Commission required HDPP to study the feasibility of using up to 100% Recycled Water for evaporative cooling and other industrial uses.

On November 3, 2014, HDPP submitted the results of the study (the “Feasibility Report”) which concluded that it is not possible for HDPP to convert to 100% recycled water use because: (a) the Facility’s water treatment system was not designed to operate on 100% recycled water, (b) the availability and delivery of recycled water is not 100% reliable, and (c) it is not economically feasible to convert the Facility so it can operate on 100% Recycled Water.¹

On October 9, 2015 -- eleven months after HDPP submitted the Feasibility Report and only days before HDPP’s November 1, 2015 ordered date to submit its *Petition for Modification to Drought-Proof the High Desert Power Project* — Staff docketed its response to the Feasibility Report.² Staff disagreed with HDPP’s conclusions, asserting that on “average”, there is sufficient Recycled Water of suitable quantity and quality available for the Facility to run on 100% recycled water, except in emergency shortage situations, and that the economic impact to HDPP for the cost of converting the Facility to operate on 100% Recycled Water is “small” and “not significant”.³

Staff’s response leads HDPP to believe that the Feasibility Report was reviewed with preconceived conclusions in mind without adequate examination of the Facility’s water supply situation and the market realities for a merchant power plant without a long-term power purchase agreement.

¹ TN # 203306. *High Desert Power Project Recycled Water Feasibility Study Report*. Docketed Date November 3, 2014.

² TN # 206321. *Staff Analysis of the High Desert Power Plant Recycled Water Feasibility Report*. Docketed Date October 9, 2015.

³ TN # 206321. *Staff Analysis of the High Desert Power Plant Recycled Water Feasibility Report*. Docketed Date October 9, 2015.

In terms of the quality of information relied upon by Staff, HDPP notes that during Staff's 11-month review, no one from the Energy Commission contacted HDPP to physically evaluate the Facility or to clarify issues regarding recycled water supply and economic feasibility as presented in the Feasibility Report. Staff's response demonstrates a misunderstanding regarding how merchant power plants operate in the California marketplace, and the Facility in particular.

HDPP would prefer that the focus be on the Petition for Modification to Drought-Proof the High Desert Power Project, filed by HDPP as directed by condition SOIL&WATER-1. Unfortunately, the effect of Staff's review of the Feasibility Report has been to disseminate incorrect information about the feasibility of using Recycled Water at the Facility, which compels HDPP to file this Response.

- **COVER LETTER:**

“Staff has concluded that it is feasible for HDPP to use 100% recycled water with the provision of an emergency backup water supply.”

HDPP Response: Determining the feasibility of any undertaking is not limited to simply technical ability but rather encompasses other elements of achievability including economics and prudence of business operations. Without all of these elements in alignment, no project is feasible. The Feasibility Report addresses each of these components and concludes, for reasons stated therein, that it is not feasible for HDPP to use 100% recycled water with the provision of an emergency backup water supply based on findings in the 2009 – 2014 feasibility study ordered by the Commission.

- **SUMMARY**

HDPP Response: The Summary includes multiple conclusions and arguments that HDPP disputes. HDPP addresses the specific statements and assumptions discussed in the body of the Staff response in the sections below rather than respond to the conclusions and arguments in the Summary.

- **BACKGROUND, Page 2:**

“HDPP was licensed by the Energy Commission in 2000. During the licensing process, the issue of water availability was extensively debated since the project was going to be constructed in an area where water resources are limited and under adjudication.”

HDPP Response: The Facility was certified by the Commission on May 3, 2000. After careful study by Staff during the certification process, including retaining third party experts to focus on water resources, the Commission certified the Facility to use SWP Water and an aquifer banking system only. HDPP invested hundreds of millions of dollars to construct the Facility in reliance on those authorizations. The Judgment after Trial (i.e., the adjudication) was affirmed in August

2000. Thus, the conditions under which the Facility operates have changed since it was certified and the new conditions have had a far-reaching effect on the management of water supplies in the Mojave Groundwater Basin. In particular:

1. The Facility was certified 15 years ago and the circumstances existing then have significantly changed, and are generally no longer applicable. Commission decisions must be based on current water resources and Facility circumstances, not on outdated historical disputes.
2. The Judgment adjudicated the Basin's water rights and affirmed a physical solution to appoint a Watermaster to balance withdrawals (pumping) and recharge to maintain safe yield of the Basin. Since that time, storage in the Alto Subarea where the Facility is located has risen steadily. So much so that the Watermaster has declared that water supplies in the Alto Subarea are sustainable.⁴
3. As a result of the adjudication and the Watermaster's effective and efficient management of water in the Basin, water resources are plentiful and sustainable, and the Mojave Groundwater Basin is an example of the sustainable management envisioned by the 2014 Sustainable Groundwater Management Act.

- **BACKGROUND, Page 2:**

“Since the project was licensed to use up to 4,000 AFY....”

HDPP Response: The project's design basis is 4,000 AFY. There is no 4,000 AFY limitation in the Certification. Similar misstatements about an AFY “limit” are elsewhere in the document. See for example the following: “Each of these scenarios assumed that the project would use the maximum permitted amount of 4,000 AFY,” p. 4; “Staff believes that it is not realistic to use the maximum permitted amount of 4,000 AFY as the basis for analysis of annual availability of the recycled water supply,” p. 5; and “... HDPP is permitted for no more than 4,000 AFY...,” p. 7.

- **BACKGROUND, Page 3:**

“Recognizing these effects, the Energy Commission recommended that the project owner conduct a feasibility study to determine what would be needed for the project to switch to 100 percent recycled water for its operations.”

HDPP Response: As ordered by the Energy Commission, the project owner conducted the recommended study from 2009 to 2014, and incurred about \$2.75 million of costs retaining numerous engineering firms, water treatment equipment design and manufacturing companies, and independent water treatment consultants to review HDPP's water treatment system, perform tests, install and test temporary, alternative treatment technologies, and recommend improvements to allow HDPP to use up to 100% recycled water. Some of the companies HDPP retained were the designer and manufacturer of the original water treatment system. The Feasibility Report concluded that it was not feasible to operate the project on 100 percent recycled water because: (i) the recycled water supplier was projected to have insufficient

⁴ *Twenty-First Annual Report of the Mojave Basin Area Watermaster – Water Year 2013-2014. May 1, 2015, p. 35.*

recycled water supply in some years, (ii) the recycled water supplier's inability to deliver recycled water in quantities and qualities needed by the project on a 24 hour per day basis, (iii) the project's water treatment system was not designed to operate on 100% recycled water, and (iv) the cost to upgrade the water treatment system to operate on 100% recycled water is extremely high and, as a merchant generator, it is not economically feasible for HDPP to incur the cost of conversion.

- **ANALYSIS, Page 5:**

“The average annual water consumption indicates that the project has only used about 70 percent of the maximum permitted amount since it began operation. Staff believes that it is not realistic to use the maximum permitted amount of 4,000 AFY as the basis for analysis of annual availability of the recycled water supply.”

HDPP Response: Throughout its analysis, Staff asserts that historical annual averages should be used as the basis to define the Facility's future water supply requirements, and that because HDPP did not embrace this concept the modeled scenarios presented in the Feasibility Report provide skewed results that should be disregarded. HDPP disputes Staff's assertion. Average historical water use is not a reasonable basis for defining the Facility's future water supply requirements. No single year is an “average” year and power plants such as the Facility which must maintain dispatch flexibility do not run on “average.” Instead, power plants must be capable of varying output from minimum to maximum on an hourly, daily, monthly and annual basis as required by grid reliability and market conditions. The Facility's water supply must be capable of supporting a reasonable maximum use requirement even though in most years the Facility is not expected to use the maximum amount, and it is prudent to have contractual rights and regulatory authority to all sources of water in amounts sufficient to provide all necessary quantities as if any source was singularly available in any given year.

- **ANALYSIS, Page 6:**

“Another factor that could affect availability of supply, as stated by the project owner, is the construction of sub-regional treatment plants in Hesperia and Apple Valley, which would reduce flows to VVWRA. These treatment plants would intercept about 2 million gallons per day, or about 2,000 AFY, of wastewater that would otherwise go to the VVWRA regional plant and be processed to recycled water. * * *The VVWRA board of directors awarded the contracts for construction of those two sub-regional plants in January 2015. Construction is expected to be completed 28 months from the award date. However, information provided by VVWRA staff, as well as projections made by the project owner, showed that the impact of the construction of those sub-regional plants on the availability of a sufficient amount of recycled water to the project would be limited to 1 or 2 years immediately following the commissioning of those plants. Projected population growth is expected to make up for flows intercepted by those plants shortly thereafter.”

HDPP Response: The Staff response is devoid of any factual basis for the assertion that “population growth is expected to make up for flows intercepted” by new subregional facilities

that will unquestionably divert supply away from HDPP. If the Victorville area is as water-limited as Staff suggests, new population growth and its impact on the availability of recycled water is similarly limited. Staff's statements are simply unsupported.

Similar, unsupported statements occur elsewhere in the document: "CVV and VVWRA staff indicated that there are signs of economic recovery in the area. Thus population growth is expected to rebound towards projected levels, which means that wastewater flows to the VVWRA treatment plant in general are expected to increase." These assumptions are unsupported, and more importantly, assumptions cannot form the basis for a secure future water supply. Certainty of supply is required.

- **ANALYSIS, Pages 6-7:**

"Another factor discussed by the owner that would limit availability of recycled water is the revival of the VV2 project, which was licensed by the Energy Commission in 2008. It recently received a license extension to 2018. Staff believes, however, that VV2 is unlikely to be built and compete for recycled water."

HDPP Response: While Staff may believe that VV2 will not be built, CEQA requires that all reasonably foreseeable circumstances be evaluated, and since VV2's license remains in effect, it must be evaluated as a matter of law. Consequently, it is not only prudent but is also required for HDPP to factor in VV2 for all scenarios. Staff is obligated to include VV2's consumption in assessing recycled water availability until VV2's license is formally revoked.

- **ANALYSIS, Pages 6-7:**

"Staff believes, however, that VV2 is unlikely to be built and compete for recycled water. This assessment is based on the following factors:

f. In contrast, HDPP has a contract for resource adequacy of [REDACTED]"⁵

HDPP Response: Staff contends that a certain resource adequacy contract is a key factor regarding why it is unlikely that the VV2 plant will be built and compete for recycled water resources. To the contrary, HDPP's resource adequacy contract is a small portion of annual capacity procurement obligations and therefore does not result in a long-term competitive advantage to keep VV2 out of the marketplace.

- **ANALYSIS, Pages 7-8:**

"The project owner stated that the project needs an instantaneous supply of water at a rate of about 4,000 gallons per minute (gpm). The project owner states that it is unknown when this peak demand will occur and how long it will last, and therefore the owner requires the ability of the water supplier to deliver the water at that rate

⁵ Redacted confidential information.

every hour of every day. Staff disagrees with the project owner’s arguments and conclusions for the reasons discussed below.”

“While instantaneous spikes in power generation and demand for cooling water are inevitable, they could also be managed with the use of equalization (or buffer) storage facilities. The City already has a 1-million gallon tank and a 600,000 gallon pool which have been used to collect the recycled water from both the VVWRA plant and IWWTP. In addition, the VVWRA treatment plant has an additional onsite storage tank with a capacity of approximately 460,000 gallons that can be utilized to store recycled water for HDPP use. Even at the peak project water use of 4,000 gpm, if the combined storage (2.06 million gallons) could last the project well over 8 hours even if regular supplies were cut off.”

HDPP Response: HDPP reaffirms its assertion that a reliable water supply for the Facility must be able to meet its instantaneous requirements for every hour of every day each year. To this end, HDPP notes the following:

1. Regarding the Facility’s instantaneous water demand, for the period January 2014 through September 2015, the Facility’s actual maximum average demand over rolling 24-hour, 16-hour, and 8-hour periods was 3,438 gpm, 3,650 gpm, and 3,793 gpm respectively. These demand rates were based on actual Facility dispatch and ambient temperatures at the time and do not represent design basis values. Comparing the actual values above to the 4,000 gpm design basis clearly indicates the 4,000 gpm requirement for up to 24 hours per day is reasonable.
2. Victorville Water District (“VWD”) has communicated to HDPP that VWD can deliver 2,200 gpm from the VVWRA Shay Road facility and 360 gpm from the IWWTP on a continuous, sustained basis for a combined total of 2,560 gpm which is only 64% of the 4,000 gpm requirement described in No. 1 above.
3. When the Facility requires 4,000 gpm of instantaneous water demand, VWD must rely on VWD’s storage capacity to make up the difference between the 4,000 gpm instantaneous demand and VWD’s 2,560 gpm sustainable delivery capability. As described above, VWD is unable to deliver more than 2,560 gpm on a sustainable basis.
4. Even though VWD has access to 2.06 million gallons of storage, the only storage that serves HDPP’s 4,000 gpm instantaneous demand requirement is VWD’s one million gallon elevated storage tank because that tank is the only storage source that delivers water to HDPP and that tank cannot supply water to the Facility and be re-filled from VWD’s other storage sources at the same time.
5. When the Facility has a 4,000 gpm instantaneous demand, the one million gallon elevated storage tank can only provide an estimated 9 hours of supply to the Facility before the tank is empty and must be refilled. As described above, while the tank is being refilled, recycled water delivery to the Facility from VVWRA is

limited to 2,560 gpm.

6. From the description above, it is also clear that when VWD delivers recycled water to the Facility from the one million gallon elevated storage tank, it would not have had the ability to deliver the Facility's 3,438 gpm 24-hour maximum demand requirement during January 2014 through September 2015.

- **ANALYSIS, Page 8:**

“A pumping test was carried out recently by VVWRA to see if the recycled water can be delivered directly to the project without the need to pump it to the elevated tank, which would result in substantial savings in pumping costs. The test showed that one pump was run up to its design pressure and was found to be capable of delivering 2,850 gpm, while the second pump, which was run up to a pressure head of only 139 feet, or about 86 percent of the maximum pressure head the pump is rated for, was found to be capable of pumping as much as 2,050 gpm (CEC 2015a). The second pump would be capable of pumping at a higher rate if it was run up to its design pressure head of 159.9 feet. Thus, both pumps are capable of delivering a total of at least 4,900 gpm, which is about 22 percent more than the maximum need of the project.”

HDPP Response: On February 19, 2015 — and at HDPP's request — HDPP and VVWRA conducted a test to determine what flow rate could be delivered from the VVWRA Shay Road wastewater treatment plant to the Facility if water was delivered directly from the Shay Road plant to the Facility bypassing delivery through the one million gallon elevated storage tank. The test was performed manually because automatic controls and telecommunication equipment between HDPP and the Shay Road plant do not exist to control delivery through the “direct” flow path. The test determined the maximum flowrate achievable is 2,800 gpm. Even though VVWRA has higher pumping capability (as described above by Staff's summary), higher flows cannot be achieved because the pipeline pressure required to deliver more than 2,800 gpm would exceed the pressure limitation of the pipeline between the Shay Road plant and the Facility.

“In addition, water conservation being undertaken pursuant to the Governor's executive order is not really affecting waste water flows since most savings is coming from reduced outdoor irrigation and runoff which does not flow to a wastewater treatment plant.”

HDPP Response: The Governor's Executive Order required the State Water Resources Control Board to impose restrictions to achieve a statewide 25% reduction in potable urban water usage through February 28, 2016. This translated to a 38% reduction to the VWD. The State Water Resources Control Board was required to direct urban water suppliers to develop rate structures and other pricing mechanisms, including but not limited to surcharges, fees, and penalties, to maximize water conservation consistent with statewide water restrictions. Although the Governor's Executive Order specifies restrictions and prohibitions regarding use of potable water for certain outdoor irrigation circumstances, no specific percentage reductions were issued by the Governor, and the Energy Commission Staff provide no data which support its assertion

that in the Victorville area “...most savings is coming from reduced outdoor irrigation and runoff which does not flow to a wastewater treatment plant.” Staff’s assertion is not supported by citation to fact or data.

- **ANALYSIS, Page 9:**

“Staff agrees with the project owner that the capacity of current on-site treatment facilities is not adequate to treat all the recycled water needed for the project since those facilities were designed to treat SWP water which has different water quality characteristics. However, the use of recycled water, even though it requires expansion of treatment facilities at the project, presents a reasonable alternative to transient or permanent shut down of the project.”

HDPP Response: HDPP does not understand Staff’s basis for concluding that expansion of the treatment facilities is a “reasonable alternative” because it is not feasible to do so as established in the Feasibility Report. It is the avoidance of transient or permanent shut down of the project that HDPP is trying to protect against by having the right to access multiple sources of water supply that in combination can be utilized to operate the Facility reliably and deliver energy and capacity to the CAISO market. Staff’s overall reasoning presented in its response causes HDPP to conclude that Staff does not correctly understand the economics of the Facility.

“It should be noted here that the project has managed to use up to 33 percent of its water needs from recycled water even though it was also treating SWP water for injection purposes. This indicates that the treatment capacity of the current system is capable of treating more than 33 percent of the total project water need of recycled water.”

HDPP Response: Staff’s response is inaccurate and misleading. The treatment system used to treat SWP Water for injection into the aquifer bank is separate and independent from the system used to treat the cooling tower blowdown and has no association with the amount of recycled water that the Facility can treat. During the feasibility analyses, HDPP was able to periodically blend 33% recycled water but sometimes required additional temporary equipment to be brought on-site to supplement the cooling tower blowdown water treatment system as part of the recycled water testing program.

- **ANALYSIS, Page 10:**

“The HDPP recycled water samples for silica showed that the silica concentrations have always been less than the contractual limit of 40 ppm. In fact the measured silica concentrations have been approximately half the maximum specified. Even though the project owner stated on several occasions that silica causes fouling of the microfilters, the owner did not give any details as to the way silica causes the fouling of the microfilters, or what options might be used, like pretreatment, to enable silica removal.”

HDPP Response: Silica causes fouling of the microfilters when small silica molecules penetrate into the microfilter membranes, chain together (i.e., polymerize) and foul the microfilter pores.

In May 2015, HDPP added an additional (third) stage to the cold lime softening process that provides more time for the softening reaction to precipitate out magnesium hydroxide and adsorb silica upstream of the microfilters. Prior to the addition of the third stage softening process, magnesium hydroxide was precipitating in the microfilter membrane structure and absorbing reactive silica. Subsequent monitoring and testing of HDPP's water treatment system has shown that microfilter performance has improved since the addition of the third stage softening process. However, this change alone is not sufficient for the Facility to operate on 100% recycled water.

“For example, staff was told that if hardness is removed from the incoming water before removing or reducing silica, the treatment process could be more effective and efficient. Also, staff has learned that when the other plant used an ultrafilter before the reverse osmosis step instead of the microfilter, the behavior of the treatment system improved considerably. The other plant also experienced frequent operational and maintenance issues due to processing of blow down in the ZLD system, but when the ultrafilter was added, those issues were overcome.”

“The engineering analysis presented by the project owner in Appendix B proposes to use a cold lime softening method to deal with the hardness in the incoming recycled water. The analysis also mentioned that warm lime softening is a more efficient method for removal of hardness. However, the analysis ruled out this method due to the high costs associated with heating the incoming recycled water. It might be possible to use heat that is being dissipated by the cooling tower to heat up the incoming recycled water so that warm lime softening can be used. This seems to be a logical thing to consider since it would help in the cooling process by use of the waste heat while also reducing the potential for water consumption. Given the efficiency that can be achieved with the warm lime softening method, staff recommends that the project owner consider this as a way to come up with a less costly treatment system.”

“Based on discussions with experts involved in water treatment, the costs quoted by the project owner seem to be too high, especially since the backbone of the treatment system is already in place.”

HDPP Response: HDPP retained numerous engineering firms, water treatment equipment design and manufacturing companies, and independent water treatment consultants to review HDPP's water treatment system, perform tests, install and test temporary, alternative treatment technologies, and recommend improvements to allow HDPP to use up to 100% recycled water. Some of the companies HDPP retained were the designer and manufacturer of the original water treatment system. Staff, on the other hand, held only discussions with unidentified technical resources without visiting the Facility or engaging them in detailed study. HDPP is better served to rely on the recommendations and cost estimates of its experts than the recommendation of third parties who have never been to the Facility and who are not familiar with the design, performance and operation of the Facility's water treatment system. In addition:

1. With respect to the idea of removing hardness from incoming water before removing or reducing silica, the idea of performing pre-treatment on 100% of the

incoming recycled water does have merit as described in the Feasibility Report, Confidential Exhibit B. Pre-treatment softening alone however would not remove chloride from the incoming recycled water and chloride would likely become the limiting factor preventing HDPP from operating on 100% recycled water. In addition, HDPP evaluated converting the existing clarifier to a “softening clarifier” to soften recycled water. However, HDPP would then be prohibited from treating incoming SWP Water for injection into the Facility’s aquifer bank because a clarifier that has treated recycled water cannot be used to treat SWP Water for banking due to HDPP’s restriction on injecting recycled water.

2. With respect to replacing the Facility’s existing microfilters with ultrafilters, the Facility microfilters’ pore size is 0.1 micron in diameter. Ultrafilter pore size ranges from 0.01 to 0.1 microns in diameter, so the Facility’s microfilters filtering capability is already very close to that of an ultrafilter. Regardless, without the addition of the third stage softening described above, ultrafilters or microfilters would have plugged from the silica adsorption on post precipitated magnesium hydroxide described above. In addition, HDPP’s engineering consultant advised that smaller pore size in the filtration technology likely would not allow the Facility to convert to using 100% recycled water.
3. Staff’s suggestion to consider using heat from the cooling tower to heat up incoming recycled water is similar to the “warm lime softening” option that was described in the Feasibility Report, Confidential Exhibit B, which concluded that warm lime softening would be cost prohibitive.

“The fact that seven power plants regulated by the Energy Commission use 100 percent recycled water of similar characteristics for cooling purposes while they also employ Zero Liquid Discharge (ZLD) systems indicates that it is economically viable for HDPP to use recycled water.”

HDPP Response: Staff did not identify the seven power plants in its response. HDPP has subsequently learned the identity of the plants and has determined that none of them were certified with a prohibition on the use of recycled water and none were forced to convert from one water source to a wholly different water source. Conversion of an existing power plant – with unrecoverable sunk costs – is a very different proposition than building a new power plant to use recycled water.

The permitting process and operating circumstances surrounding *every* power plant are different and Staff provides no information to support its assertion. The fact that seven other power plants with ZLD systems run on recycled water has no bearing on whether it is economically feasible for the Facility to use 100% recycled water. In Confidential Exhibit D of the Feasibility Report, HDPP provided detailed financial information as to why it is not economically feasible to convert the Facility to use 100% recycled water. It is unreasonable for Staff to ignore this information and to conclude that simply because other plants use recycled water, it is economically feasible for HDPP to use 100% recycled water. With no other comparisons to the

Facility — particularly a demonstration of each plant’s economic operating conditions — Staff’s comment can only be viewed as baseless.

- **ANALYSIS, Page 11:**

“Based on discussions with experts involved in water treatment, the costs quoted by the project owner seem to be too high, especially since the backbone of the treatment system is already in place.”

HDPP Response: Staff does not disclose the qualifications of the “experts” it consulted or the nature of that consultation. There is no evidence to support Staff’s unsubstantiated opinion. As to the “backbone” argument, Staff’s analogy misses the point. The existing HDPP facilities are limited by the original equipment design and small footprint of the property – as approved by the Commission. Additional treatment of recycled water would require expensive new equipment as opposed to the mere expansion of capacity of the existing equipment.

- **ANALYSIS, Page 12:**

“Using the cost estimates provided by the owner, the model results show the increased cost for Option 1 is only \$2.05/MWh and \$2.22/MWh for Option 2. This is the equivalent of about 0.2 cents/KWh. Based on these estimates staff concludes that the incremental cost in the levelized cost of electricity is small and should not result in a significant change in economics for the plant given an assumed remaining life of operation of 18 years.”

“Another mitigating factor for cost to convert to 100 percent recycled water is the difference in cost for recycled versus fresh water. Based on information provided by the owner ([Confidential] Exhibit F of the feasibility report), the current costs are \$402/AF for recycled water and \$473/AF for SWP water. With average water use of 2,872 AFY there would be annual savings of about \$204,000 with the use of recycled water.”

“Staff notes that these savings also do not include avoided costs associated with procurement, treating, pumping, and recovering SWP water to and from the groundwater bank. These savings could be used to offset capital or operations and maintenance costs.”

HDPP Response: A response, citing to confidential business information, will be filed separately, consistent with the requirements of the Commission’s Regulations, 20 CCR § 2505, *Designation of Confidential Records*.

In addition, Staff’s economic analysis simply compares the levelized cost of energy on a \$/MWh basis for a new power plant with incremental capital costs to simulate the financial impact to HDPP to convert the Facility to use 100% Recycled Water. Staff’s analysis concludes the incremental cost is “small” and “not significant”. Staff’s analysis does not consider the source of capital required to pay for the cost to convert the Facility to use 100%

Recycled Water and Staff's analysis does not take into consideration the total cash flow impact to HDPP on a dollars per year basis. The current California energy and capacity markets do not provide sufficient energy and capacity revenue for HDPP to recover the incremental capital and operating cost associated with operating on 100% recycled water. Unlike a regulated investor-owned utility, HDPP cannot simply pass its costs on to retail customers. Rather, HDPP must rely on the capacity and energy markets to recover the capital and operating costs associated with operating on 100% recycled water.

- **CONCLUSIONS, Page 13:**

“(1) Overall, the annual total amounts of recycled water from the VVWRA plant and IWWTP would be sufficient to meet HDPP needs,” [SIC]

HDPP Response: Throughout its document, Staff asserts that historical annual averages should be used as the basis to define future water supply requirements. HDPP disputes the Staff's assertion. Average historical water use is not a reasonable basis for defining the Facility's future water supply requirements. No single year is an “average” year and flexible power plants such as the Facility do not run on “average.” Instead, they must be capable of varying their output from minimum to maximum on an hourly, daily, monthly and annual basis as required by grid stability and market conditions. The Facility's water supply must be capable of supporting a reasonable maximum use requirement even though in most years, the Facility will not use the maximum amount.

“(2) The VVWRA treatment plant has adequate capacity to meet project peak demand of 4,000 gpm. In addition, using the existing equipment and storage infrastructure, VVWRA has the capacity to meet the project peak demand during an interruption for a minimum of 8 hours and up to 24 hours depending on demand and concurrent deliveries. This should be more than adequate to meet the project peak demands for the time when this short term need occurs. VVWRA currently has two pumps with a combined capacity of more than 4,900 gpm, which exceeds the project's maximum demand. As an added redundancy, the city is going to install an additional pump to be used when either of the two existing pumps is down for maintenance, thereby adding another layer of assurance that HDPP would receive all the recycled water it needs.”

HDPP Response: Staff's conclusion does not correctly account for the existing design of VWD's recycled water distribution system. Specifically:

1. When delivering recycled water from the VVWRA treatment facility to HDPP, VWD can only provide 4,000 gpm for about 4.2 hours before VVWRA's one million gallon elevated storage tank that supplies water to the Facility would be emptied.
2. Regarding storage, even though VWD has access to 2.06 million gallons of storage, the only storage that serves HDPP's 4,000 gpm instantaneous demand requirement is VWD's one million gallon elevated storage tank because that tank is the only storage source that delivers water to HDPP and that tank cannot supply

water to the Facility and be re-filled from VWD's other storage sources at the same time.

3. Flow tests conducted by HDPP and VVWRA in February 2015 determined the maximum flowrate that can be achieved when delivering water through the direct flow path between VVWRA and the HDPP Facility is 2,800 gpm. Even though VVWRA has higher pumping capability than 2,800 gpm, higher flows cannot be achieved because the pressure required to deliver more than 2,800 gpm would exceed the pressure limitation of the pipeline between the VVWRA treatment plant and the HDPP Facility. Currently, there are no electronic controls and communication equipment between the HDPP Facility and the VVWRA treatment plant as required to facilitate automated delivery of recycled water to the HDPP Facility along the "direct delivery" flow path.

"3) Based on the contractual requirements for recycled water supply between HDPP and VVWRA, and staff experience with other power plants using 100 percent recycled water and ZLD, the recycled water is of sufficient quality for delivery and use by the project."

HDPP Response: The fact that other power plants with ZLD systems run on recycled water has no bearing on HDPP's ability to use recycled water at the Facility.

HDPP acknowledges that recycled water delivered from the VVWRA Shay Road Facility has generally met the quality limits specified in the recycled water supply agreement between HDPP and VWD. However, for those periods when the Shay Road plant can't meet the supply agreement quality limits, VWD has suspended delivery of recycled water to HDPP.

HDPP's experience to date is that recycled water delivered from the IWWTP has not met the quality limits specified in the recycled water supply agreement. For those periods when HDPP has accepted water from IWWTP due to emergency drought conditions, HDPP blends IWWTP recycled water with groundwater to dilute the IWWTP recycled water to an acceptable quality. As of the date of this response, VWD has not provided a firm timeline on when the IWWTP water will meet the agreement quality limits.

"4) Staff acknowledges that the onsite water treatment system was not designed to treat and remove the higher amount of impurities if 100 percent recycled water is to be used by the project. However, with minor modifications the owner has been able to use up to 33 percent recycled water. This is an indication that with incremental expansion of the existing system the project owner could reasonably use up to 100 percent recycled water. The Energy Commission also regulates seven other power plants that already use 100 percent recycled water and a ZLD for wastewater treatment which further indicates use of these treatment systems is economically feasible."

HDPP Response: HDPP disputes the Staff's conclusion. During the Feasibility Report HDPP was able to periodically blend 33% recycled water but sometimes required additional temporary

equipment to be brought on-site to supplement the cooling tower blowdown water treatment system as part of the recycled water testing program. Had the temporary water treatment equipment not been used, HDPP could not have run on 33+% recycled water while maintaining the cooling tower water at acceptable qualities and while maintaining the Facility's PM₁₀ emissions within permitted limits. Upgrading the cooling tower blowdown treatment system to operate on 100% recycled water is economically infeasible for HDPP.

As previously explained in this document, the fact that seven other power plants with ZLD systems run on recycled water has no bearing on HDPP' ability to use recycled water at the Facility. Staff's conclusion is without merit.

“5) Staff recognizes that the cost to expand the treatment system appears to be significant. However, staff believes the incremental increase in the levelized cost of electricity due to installation of one of the water treatment options would be minimal and could be recovered over the remaining life of the project.”

HDPP Response: HDPP disagrees with Staff's conclusion because: (i) the current California energy and capacity markets do not provide sufficient energy and capacity revenue for HDPP to recover the capital and operating costs associating with converting the Facility to operate on 100% recycled water, (ii) Staff's analysis completely ignores the Feasibility Report's Confidential Exhibit D describing HDPP's existing capital structure and that there are no sources of capital available to fund additional capital projects, (iii) even if HDPP was recapitalized such that it carries less debt than it currently does, there would still not be sufficient cash flow for HDPP to finance additional water treatment system capital improvement projects, and (iv) Staff's economic analysis that looked at the levelized cost of electricity on a \$/kW-year and a \$/MWh basis and concluded that the differences were “small” and “not significant” is flawed because it does consider the annualized cash flow impact to HDPP.

Respectfully submitted,

Original signed by: *Samantha G. Pottenger*

Dated: December 9, 2015

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