

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO.

WASTE DISCHARGE REQUIREMENTS

FOR

UNIVERSITY OF CALIFORNIA DAVIS CAMPUS  
J. AMOROCHO HYDRAULICS LABORATORY  
YOLO COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Water Board) finds that:

1. The University of California, Davis (UCD, hereinafter Discharger) is the owner and operator of the J. Amorocho Hydraulics Laboratory (hereinafter facility), a university testing and research laboratory.
2. The Discharger is currently discharging pursuant to Waste Discharge Requirements (WDRs) Order No. R5-2002-0088 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA00841182. The Discharger submitted a Report of Waste Discharge (RWD), dated August 28, 2006, and applied for a NPDES permit renewal to discharge up to 177,600 gallons per day (gpd) as a maximum daily flow of untreated wastewater from the facility.
3. On 21 March 2008, the Discharger requested the Regional Water Board to review the NPDES outfall location and reclassify the outfall location as a discharge to land. On 14 April, the Discharger provided additional information and on 14 May, Regional Board staff transferred the facility to the land discharge program. In addition, the Discharger has constructed a 126,000 gallon retention basin as a second outfall location.
4. In the 1930's Putah Creek was redirected from its historic course through the north fork in order to prevent flooding in downtown Davis. At that time, the U.S. Army Corps of Engineers dredged and aligned the south fork, which is now the primary channel of Putah Creek. The north fork has not received flows from Putah Creek since the 1940's and is enclosed with both upstream and downstream barriers: A concrete surface impoundment has been constructed immediately downstream of the facility's discharge point. The north levee of Putah Creek serves as the upstream barrier. However, the levee has an elevated culvert that allows one-directional flow from the dry creek bed, but the culvert is regulated to prevent flow from Putah Creek into the north fork. The Discharger estimated that the hydraulic ponding capacity of the north fork is 350,000 gallons before the culvert allows flow into Putah Creek. Thus, the discharge into the north fork is limited to an amount below this volume.
5. On 14 May, Regional Water Board staff evaluated the current discharge point and determined that the discharge belongs under the land discharge program. The reclassification was approved because in addition to the information in Finding No. 4, the

north fork of Putah Creek is no longer a water body and would not be considered as a "water of the U.S." for the purposes of the Federal Clean Water Act.

6. The facility is on the University of California Davis campus in Yolo County and is west of the main campus along Brooks Road and one-quarter of a mile north of Levee Road, in Section 20, T8N, R2E, MDB&M (latitude 38° 31' 35" and longitude 120° 46' 55"). The facility location is shown on Attachment A, which is attached hereto and made part of this Order by reference.

### **Existing Facility and Discharge**

7. The facility is a testing and research laboratory, which conducts experiments on hydraulics and fish swimming performance, behavior, and physiological response. A fish treadmill, an indoor sturgeon flume, a slope-adjustable glass flume, several fish holding tanks, and a wind tunnel occupy the indoor area. A large flume and temporary holding tanks are located under the covered outdoor area. The indoor and outdoor areas have separate water circulation systems but are piped to discharge to either of the discharge points. The site plan of the facility is shown on Attachment B, which is attached hereto and made part of this Order by reference.
8. The indoor fish holding tanks consist of three 10-foot diameter and one 12-foot diameter tanks, nine 55 gallon and two 95 gallon tanks, and a temperature controlled head tank from which water is circulated to the holding tanks. Waters are exposed to fish only when fish experiments are conducted. Fish are collected from their native habitat or another facility prior to experimentation and then returned to their capture point after experimentation.
9. The outdoor temporary holding tanks consist of four 290 gallon tanks. The fish holding tanks are used only periodically to hold fish before and after experiments are conducted. Water used in the outdoor flume may be exposed to experimental fish, river bottom soils and/or riparian plants prior to discharge. Soil and plants are returned to their point of origin after experimentation.
10. Source water for the systems is either drawn from a nearby agricultural well (UCD #12 or is also known as Ag Well C3C) constructed in 1932 with a depth of 270 feet or supplied from UCD tap water.
11. Only well water is used for experiments involving fish due to their sensitivity to chlorine. Water used in fish experiments is air-equilibrated and temperature controlled in the indoor system and air-equilibrated at ambient temperature in the outdoor system.
12. The RWD states that no chemicals or toxins are added to the test water. Since a study was not performed to determine the effects of amendments on the receiving groundwater, chemical amendments are not permissible.
13. The capacity of the outdoor system is 40,000 gallons, and depending on the type of experiment, may be fully replaced every two to four weeks. The capacity of the indoor system is 80,000 gallons, and may also be replaced every two to four weeks. Each flume includes a storage tank that is used as a settling tank for the effluent prior to discharge.

14. Discharges occur intermittently and only during periods of experimentation. Experiments occur only when funding or a proposal has been awarded to the lab. For example, the current project entitled The Roughness Study of the California Native Vegetation in Floodways is funded from 01 September 2008 to 30 June 2009. The project involves four experimental runs, each testing a different riparian plant with sediment collected from the Sacramento River using the outdoor flume. Each experiment consists of three replicate batches with eight trials in each batch. Water is discharged after each batch study and not reused between batches. Each experiment will last for two or three months and requires discharging three times. Expected volumes for each discharge are 20,000 to 30,000 gallons. Setup time between experiments is about two weeks.
15. The effluent is not biologically or physically treated. Effluent will be discharged to either the north fork or the retention basin.
16. Effluent quality and source groundwater quality is presented below:

Effluent and Source Water Quality Conditions

Constituent	Units	Average Effluent Value	Max Effluent Value	Groundwater value <sup>1</sup> (6/28/04)
BOD <sub>5</sub> <sup>2</sup> @ 20° C	mg/L	< 4.0	< 4.0	-----
Total Suspended Solids <sup>2</sup>	mg/L	< 10	< 10	-----
Electrical Conductivity <sup>2</sup>	umhos/cm	572	710	700
Total Dissolved Solids <sup>3</sup>	mg/L	405	420	430
Ammonia as N <sup>3</sup>	mg/L	0.19	0.27	0.14
Nitrate as N <sup>3</sup>	mg/L	5.0	5.8	5.9
Nitrite as N <sup>3</sup>	mg/L	< 0.3	< 0.3	< 0.3
Chloride <sup>3</sup>	mg/L	21	22	22
Sulfate as SO <sub>4</sub> <sup>3</sup>	mg/L	32.5	33	33
Hexavalent Chromium <sup>3</sup>	µg/L	26	28	24
Arsenic <sup>3</sup>	µg/L	1.65	1.7	1.5

<sup>1</sup> Data provided as one sample collected from agricultural well UCD #12 on 6/28/04 during monitoring groundwater as source water for fish studies. Agricultural well UCD #12 was constructed in 1932 and has a depth of 270 feet.

<sup>2</sup> Average and max effluent values obtained from February 2002 to September 2007.

<sup>3</sup> Average and max effluent values are based on two samples taken on 10/7/02 and 6/28/04.

17. Constituents may concentrate during experimentation and holding prior to discharge due to evaporation. Excessive delay in discharging effluent may result in effluent salinity

concentrations higher than the source groundwater of 700  $\mu\text{mhos/cm}$ , expressed as electrical conductivity (EC). Therefore, a reasonable salinity increase of 100  $\mu\text{mhos/cm}$  is allowed for this water use while implementing best management practices and appropriately scheduling experiments. Thus, this Order contains a monthly average performance based effluent limitation of 800  $\mu\text{mhos/cm}$ .

### **Retention Basin**

18. The retention basin has a hydraulic ponding capacity of 126,000 gallons and the north fork has a hydraulic ponding capacity of 350,000 gallons.
19. Typical discharge volumes occurring in a single day are 60,000 gallons for the indoor flume and 30,000 gallons for the outdoor flume. Historical data from February 2002 to September 2007 indicates that the average peak discharge is 19,900 gallons with a maximum peak discharge of 53,200 gallons.
20. The north fork and retention basin are not located within the 100 year flood zone of Putah Creek. Putah Creek has a 100 year water level of 44.8 feet. The north fork point of discharge and retention basin are approximately 700 feet from Putah Creek at an elevation of 57.5 feet and 65.5 feet, respectively. Both locations have soil with a moderate to high percolation rate. The Discharger also states that rainfall percolates below ground surface within 24 hours after a precipitation event. However, infiltration rates for either discharge location have not been evaluated and thus are not considered herein.

### **Groundwater Considerations**

21. Groundwater monitoring has not previously been required and the groundwater underlying the facility has not been characterized.
22. Agricultural well water (for data see Finding No. 15, Table 1) used as source water was considered to provide an indication of groundwater quality.
23. Based on effluent data and source groundwater data, the effluent discharge is comparable to groundwater quality. Therefore, operations at the facility are not expected to impact the underlying groundwater salinity and groundwater monitoring is not being required.

### **Antidegradation Analysis**

24. State Water Board Resolution No. 68-16, *Policy with Respect to Maintaining High Quality Waters of the State* (hereafter Resolution 68-16 or the "Antidegradation Policy") requires a Regional Water Board in regulating the discharge of waste to maintain high quality waters of the state (i.e., background water quality) until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than as described in the plans and policies, including water quality objectives in the applicable Basin Plan. The discharge is required to meet waste discharge requirements that will result in the best practicable treatment or control of the discharge necessary to assure that

pollution or nuisance will not occur, and highest water quality consistent with maximum benefit to the people of the State will be maintained. It is the responsibility of the Discharger to provide information for the Regional Water Board to evaluate whether any degradation caused by the discharge is consistent with this policy, as well as the amount of degradation that would be consistent.

25. The Discharger has not provided an antidegradation analysis. The information in the Findings shows that effluent disposal, without excessive holding periods, is not expected to degrade or pollute the underlying groundwater.
26. The concentration of TDS and EC in the source groundwater at the site is approximately 430 mg/L and 700 umhos/cm. TDS and EC concentrations in the effluent discharged to the disposal areas are approximately 420 mg/L and 710 umhos/cm, respectively. Water usage at this facility is considered reasonable and not expected to effect underlying groundwater quality. However, this Order acknowledges that some degradation may occur as a result of the application of treated wastewater to land, but the Regional Water Board finds that such degradation at this facility is consistent with the maximum benefit to the people of the state, provided that the terms of the Basin Plan and the factors in Finding No. 24 are met. This Order is consistent with State Water Board policy.

### **Basin Plan, Beneficial Uses, and Regulatory Considerations**

27. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition* (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Board. These requirements implement the Basin Plan.
28. Surface water drainage from the facility is to the 126,000 gallon retention basin, area surface water drainage is to Putah Creek and the Sacramento-San Joaquin River Delta.
29. The Basin Plan designates the beneficial uses of Putah Creek from Lake Berryessa to Yolo Bypass as municipal and domestic supply; agricultural supply; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; spawning, reproduction, and/or early development; and wildlife habitat.
30. The Basin Plan designates the beneficial uses of underlying groundwater as municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.

### **Other Regulatory Considerations**

31. The State Board adopted Order No. 97-03-DWQ (General Permit No. CAS000001) specifying waste discharge requirements for discharges of storm water associated with industrial activities, and requiring submittal of a Notice of Intent by all affected industrial

dischargers. The design flow at this facility is less than 1.0 mgd and therefore the Discharger is not required to apply for storm water NPDES permit for this facility.

32. The action to update WDRs for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA), in accordance Title 14, California Code of Regulations (CCR), Section 15301.
33. Section 13267(b) of the CWC provides that: *“In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposes to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of discharging, or who proposes to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.”*

The attached Monitoring and Reporting Program No. \_\_\_\_\_ is necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that generates the waste subject to this Order.

34. State regulations that prescribe procedures for detecting and characterizing the impact of waste constituents from waste management units on groundwater are found in Title 27 CCR Section 20380. While the facility is exempt from Title 27, the data analysis methods of Title 27 may be appropriate for determining whether the discharge complies with the terms for protection of groundwater that are specified in this Order.
35. Pursuant to CWC Section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.

### **Public Notice**

36. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, as well as the Regional Water Board's administrative record, were considered in establishing the following conditions of discharge.
37. The Discharger and interested agencies and persons have been notified of the Regional Water Board's intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity to submit written comments and an opportunity for a public hearing.
38. All comments pertaining to the discharge were heard and considered in a public hearing.

**IT IS HEREBY ORDERED** that NPDES Order No. R5-2008-0088 is rescinded, and that pursuant to Sections 13263 and 13267 of the California Water Code, UCD, J. Amorocho Hydraulics Laboratory, their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted hereunder, shall comply with the following:

*Note: Other prohibitions, conditions, definitions, and some methods of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated 1 March 1991.*

**A. Discharge Prohibitions**

1. Discharge of wastewater to surface waters or surface water drainage course is prohibited.
2. Discharge of wastewater to areas other than the retention basin and north fork (hereinafter discharge areas), as illustrated in Attachment B, is prohibited.
3. Discharge of river sediment for land application or to the discharge areas is prohibited.
4. Discharge of chemically amended source water to the discharge areas is prohibited.
5. Discharge of live or dead fish to the discharge areas is prohibited.
6. Discharge of waste classified as 'hazardous' under Title 27 CCR, Section 20164, or 'designated' as defined in Section 131733 of the CWC, is prohibited.

**B. Discharge Specifications**

1. Wastewater discharge to either the retention pond or north fork shall not occur 24-hours prior to a forecasted storm event or 24-hours after a storm event.
2. Wastewater discharge to the retention basin shall not occur when ponding water is visible.
3. Wastewater discharge to the north fork shall not occur when ponding water is visible.
4. Wastewater discharge to the retention basin shall not exceed 126,000 gallons during a single discharge event.
5. Wastewater discharge to the north fork shall not exceed 180,000 gallons during a single discharge event.
6. The discharge shall not unreasonably cause the degradation of groundwater or surface water quality.

7. Wastewater discharge shall not cause pollution or a nuisance as defined by Section 13050 of the CWC.
8. Objectionable odors originating at the facility shall not be perceivable beyond the limits of the facility.
9. As a means of discerning compliance with Discharge Specification B.7, the dissolved oxygen content in the upper one foot of any standing water resulting from a discharge shall not be less than 1.0 mg/L.
10. The Discharger shall operate all systems and equipment to optimize the quality of the discharge.
11. Discharge to the retention basin and north fork shall be managed to prevent breeding of mosquitoes.

**C. Effluent Limitations**

1. The effluent shall not exceed the following limits:

Constituent	Units	Monthly Average
Electrical Conductivity	µmhos/cm	800

**D. Provisions**

1. In accordance with the California Business and Professional Code Sections 6735, 7835 and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports submitted to or requested by the Regional Water Board containing workplans for investigations and studies, describing the conduct of investigations and studies, or containing technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the Discharger shall contain a statement of qualifications of the responsible licensed professional(s) as well as the professional's signature and/or stamp of the seal.
2. The Discharger shall comply with Monitoring and Reporting Program No. \_\_\_\_, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.
3. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements," dated 1 March 1991, which are



attached hereto and made part of this Order by reference. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."

4. As described in the Standard Provisions, the Discharger shall report promptly to the Regional Water Board any material change or proposed change in the character, location, or volume of the discharge.
5. The Discharger shall report to the Regional Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986."
6. In the event of any change in control or ownership of the facility or wastewater disposal areas, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Regional Water Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code.
7. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Violations may result in enforcement action, including Regional Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or recession of this Order.
8. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.
9. The Regional Water Board will review this Order periodically and will revise requirements when necessary.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on \_\_\_\_\_.

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PAMELA C. CREEDON, Executive Officer