

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION**

320 West 4th Street, Suite 200, Los Angeles, California 90013
(213) 576-6660 • Fax (213) 576-6640
<http://www.waterboards.ca.gov/losangeles/>

RESOLUTION NO. R15-009

**WEST BASIN MUNICIPAL WATER DISTRICT'S
TEMPORARY 6-WEEK BYPASS OF BRINE FROM
EDWARD C. LITTLE WATER RECYCLING PLANT
TO HYPERION TREATMENT PLANT'S 1 MILE OUTFALL**

Whereas the California Regional Water Quality Control Board, Los Angeles Region (hereinafter Regional Water Board), finds:

1. The Regional Water Board and the United States Environmental Protection Agency (USEPA) jointly issued the Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit to West Basin Municipal Water District (West Basin) for the Edward C. Little Recycling Plant (Facility), Order No. R4-2012-0026 and NPDES CA0063401 for the discharge of brine into the Pacific Ocean with secondary treated municipal wastewater from the Hyperion Treatment Plant (HTP) discharged under Order No. R4-2010-0200. The permit was adopted in February 2, 2012.
2. The Facility treats the secondary effluent from the HTP and is designed to produce 62.7 million gallons per day (MGD) of recycled water. The design flow rate of brine generated from this treatment process is 5.2 MGD which is discharged to the Santa Monica Bay through the HTP outfall. Of the 62.7 MGD of recycled water, 40 MGD is delivered for irrigation, 17.5 MGD for groundwater injection into the West Basin sea water intrusion barrier, and 5.2 MGD is delivered for industrial uses. The Facility discharges the brine to an outfall from the HTP that conveys secondary effluent to the Pacific Ocean through the 12-foot diameter 5-mile outfall. This outfall terminates approximately 5 miles west-southwest of the treatment plant and it is the only outfall permitted for the routine discharge of undisinfected secondary-treated effluent. This outfall is designated as Discharge Point 001 for the Facility.
3. The HTP also conveys secondary effluent to the Pacific Ocean through the 12-foot diameter 1-mile outfall (HTP Discharge Point 001), which is not currently permitted to carry brine from the Facility. This outfall is approximately one mile west-southwest of the HTP and is permitted for emergency discharge of chlorinated secondary-treated effluent during extremely high flows, preventative maintenance such as routine opening and closing of the outfall gate valves for exercising and lubrication, during intense storms or storms associated with plant power outages, and direct discharge of undisinfected storm water overflow from the HTP.
4. The final ammonia effluent limitations prescribed in Order No. R4-2012-0026 for discharge from the 5-mile outfall are summarized in Table 1:

Table 1 – Final Ammonia Effluent Limitations in Order No. R4-2012-0026

Constituent	Units	Effluent Limitation	
		6 Month Median	Maximum Daily
Ammonia as N	mg/L	350	7,970
	lbs/day	15,270	345,700

These final effluent limitations are expressed as a 6 month median and a maximum daily. These limits were developed from the Ocean Plan objectives and a dilution ratio of 84:1 at the 5-mile outfall and a dilution ratio of 48.8:1 and a HTP effluent ammonia concentration of 44.83 mg/L at the point where the brine is added to the HTP effluent.

- Attachment D, Section I.G.5.a of the Standard Provisions in Order R4-2012-0026 requires West Basin to notify the Regional Water Board in advance of any anticipated bypass (40 CFR part 122.41(m)(3)(i)).

On April 30, 2015, West Basin requested approval to temporarily divert brine discharged from the normally used 5-mile outfall to the 1-mile outfall during the necessary replacement of the effluent pumping plant header, scheduled for September 2015 (2015 Effluent Pumping Plant Header Replacement Project or 2015 Hyperion EPP Project). The diversion is required by the City of Los Angeles, Bureau of Sanitation (LASAN) at the HTP to conduct major overhaul work on the effluent pumping system to prevent catastrophic failure. This work is tentatively scheduled from September 21 to November 2, 2015, a total of 6 weeks (five weeks of planned overhaul plus one week of contingency time). During the 5 week diversion period, the overhaul will be conducted continuously (24 hours per day, 7 days per week). The 5-mile outfall and effluent pumping system at HTP were placed into service in 1960 and have not had any unpredicted shutdowns for the past 55 years. Based on internal inspections of the system in 2006 and subsequent investigations, the effluent pumping system is in need of a major overhaul to prevent failure and ensure that it functions reliably. The overhaul project includes replacement of piping and the 120-inch gravity valve, and rehabilitation of various components of the effluent pumping system. A complete shutdown of the 5-mile outfall and effluent pumping system is required to perform the work.

- On April 28, 2015, representatives from West Basin, LASAN and the Regional Water Board discussed the details of the 1-mile outfall diversion during the 2015 Hyperion EPP Project. Based on final effluent water quality data and the current initial dilution ratio of 13:1 for the 1-mile outfall in the HTP Order No. R4-2010-0200, Hyperion will not be able to meet the final effluent limitations for ammonia and residual chlorine. The Regional Water Board requested that LASAN conduct a technical study to estimate the dilution that would be expected with the current discharge scenario to assess the potential impact the proposed discharge may have on human health and aquatic life.

On April 30, 2015, West Basin requested a Time Schedule Order (TSO) and interim limitations for ammonia and residual chlorine for the duration of the 2015 Hyperion EPP Project. On June 8th, LASAN submitted an extensive monitoring and reporting plan (*Environmental Monitoring Plan for the Diversion of Secondary-Treated Effluent from the 5-Mile Outfall to the 1-Mile Outfall for the EPP Header Rehabilitation Project or EPP Project Monitoring Plan*) and a dilution study evaluation for the current average flow rate from the HTP. The monitoring and reporting plan outlines the monitoring that will be conducted before, during, and after the 2015 Hyperion EPP Project. The dilution study evaluation is titled

Hyperion Treatment Plant 1 Mile Outfall Dilution Study 250 MGD Evaluation (2015 Dilution Study) and includes an evaluation of the 1-mile outfall dilution ratio during this bypass condition for chlorine residual, ammonia, and chronic toxicity, using the current average effluent flow rate of 250 MGD, recent water quality data, and data from the previous 1-mile diversion in November 2006.

7. The Hyperion 1-mile outfall is a 12 foot diameter reinforced concrete pipe approximately 5,400 feet long. The outfall includes a 300 foot diffuser section. The end of the outfall is approximately 50 feet below the water surface. There is one 18 inch by 54 inch slot on each side of each 100-foot section of the pipe forming the diffuser, and three upper ports and one lower grill on the end cap.

The Cornell Mixing Zone Expert System (CORMIX) is a dilution model approved by the State Water Resources Control Board and the United States Environmental Protection Agency (USEPA) for use in the assessment of regulatory mixing zones resulting from continuous point source discharges.

Regional Water Board staff has reviewed the CORMIX modelling results submitted by LASAN and determined that the initial dilution zone for this situation occurs when the plume covers a 200 meter radius around the HTP Discharge Point 001. The CORMIX model calculates an initial dilution ratio of 27:1 at the edge of this mixing zone. Regional Water Board staff used the 27:1 dilution ratio to calculate daily average and 6-month median interim limits during HTP's proposed 1-mile outfall discharge during the 2015 Hyperion EPP Project. These limits in effect during the temporary bypass constitute conditions that must be met during the bypass.

8. Based on the available information, the Regional Water Board staff determined that issuing a TSO for this discharge is not appropriate.
9. West Basin's discharge to the Hyperion 1-mile outfall is considered a bypass of the 5-mile outfall. Order No. R4-2012-0026 [Provision I.G.3 of the Standard Provisions] and 40 Code of Federal Regulations (CFR) Part 122.41 (m)(4)(i) prohibit bypass- the intentional diversion of waste streams from any portion of a treatment facility. Provision I.G.3 (Order No. 2012-0026) and 40 CFR Part 122.41 (m)(4)(ii) provide that the permitting authority may approve an anticipated bypass, after considering its adverse effects, if the bypass meets the following conditions:
 - a. Bypass was unavoidable to prevent loss of life, personal injury or severe property damage;
 - b. There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated waste, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - c. The permittee submitted a notice at least ten days in advance of the need for a bypass to the Regional Board.
10. The bypass is unavoidable because it is required for the proper maintenance and operation of the 5-mile outfall to prevent catastrophic failure and it was selected as the best feasible alternative as described in Resolution R15-008 There are also no feasible alternatives for Hyperion to store the effluent for the required amount of time and the upstream treatment

plants cannot treat the daily flow rate. Based on the foregoing findings, the documents contained in the record, and the notice provided on April 30, 2015, the Regional Board finds that the 6-week bypass complies with the conditions in Provision I.G.3 of the Standard Provisions and 40 CFR Part 122.41 (m)(4)(i) for an approved bypass. The Regional Board also finds that the 6-weeks bypass is for the benefit of the public in the long-term.

11. Based on the foregoing findings and the documents contained in the record, the Regional Board finds that the 6-week bypass complies with the conditions in Provision I.G.3 of the Standard Provisions and 40 CFR Part 122.41 (m)(4)(i) for an approved bypass. The Regional Board also finds that the 6-week bypass is for the benefit of the public in the long-term.
12. This Resolution conditionally approves the bypass of West Basin's brine from the 5-mile outfall to the Hyperion 1-mile outfall and the corresponding interim limits during the 2015 Hyperion EPP Project with special conditions. These interim limitations only apply during this project, are consistent with the Ocean Plan Objectives, incorporate a dilution ratio of 27:1, and are expressed as a maximum daily and an instantaneous maximum.

During the temporary diversion of secondary effluent to the 1-mile outfall, the City of Los Angeles will be chlorinating the discharge of secondary effluent from the Hyperion Treatment Plant to decrease microbial levels to below state water quality standards to protect beaches and nearshore water contact recreation areas. Since the chlorination injection point is located adjacent to the legal sampling point specified in the Hyperion Treatment Plant's NPDES permit, monitoring at this location would not be representative of the final chlorine residual discharged to Santa Monica Bay. Therefore, Resolution R15-008 approving the Hyperion Treatment Plant's bypass during the 2015 Hyperion EPP Project, specifies that the point of compliance for monitoring of chlorine residual shall be relocated to the End-of-Pipe (ie. at the end of the 1-mile outfall where it discharges to the ocean). This will allow the initial chlorination dose to be reduced to comply with the established limitations for chlorine residual, due to mixing and exertion of chlorine demand by the secondary effluent during the approximately 30-minute duration required for the discharge to reach the end of the 1-mile outfall.

The West Basin Municipal Water District brine discharge from the Edward C. Little Water Recycling Plant will contain a chlorine residual, since chlorination is used during the treatment process to protect the membranes used to produce reclaimed water from biofouling. This brine will be comingled with the Hyperion secondary effluent for discharge through the 1-mile outfall during the 2015 Hyperion EPP Project. Because dilution and decay of the chlorine takes place during transport, the point of compliance for chlorine residual for the West Basin Municipal Water District also shall be relocated to the End-of-Pipe (ie., at the end of the 1-mile outfall where it discharges to the ocean). Monitoring for compliance with the interim limitations for chlorine residual may be conducted jointly by the West Basin Municipal Water District and City of Los Angeles (i.e., duplicate monitoring is not required).

WQBEL Calculations

As discussed in Order R4-2012-0026, the West Basin effluent undergoes two mixing events during discharge to the Pacific Ocean using the 1-mile outfall. The first mixing event occurs when the West Basin and Hyperion Treatment Plant effluents combine and mix inside the HTP 1-mile outfall. The second mixing event occurs immediately following discharge of the combined effluents from the HTP 1-mile outfall to the Pacific Ocean. Because the West Basin effluent undergoes two mixing events during discharge, both mixing events are considered when developing WQBELs for ammonia and residual chlorine.

1. Second Mixing Event Calculation

The first step is to calculate the ammonia effluent concentrations allowed by the 27:1 dilution provided by the Hyperion Treatment Plant "1-mile outfall", using the following equation:

$$C_e = C_o + D_m (C_o - C_s)$$

Where:

C_e = effluent limitation

C_o = water quality objective to be met at the completion of initial dilution

C_s = background seawater concentration

D_m = minimum probable initial dilution expressed as parts seawater per part wastewater

The minimum probable initial dilution (D_m) is based on the approved dilution ratio for the HTP 1-mile outfall during the 2015 Hyperion EPP Project with a maximum discharge of 250 MGD and the C_s for ammonia equals zero. The ammonia effluent concentrations allowed by the 27:1 dilution for the HTP 1-mile outfall are calculated as follows using the water quality objectives from the 2012 Ocean Plan: Table F-9.

Ammonia

Daily Maximum $C_e = 2.4 + 27 (2.4 - 0) = 67.2 \text{ mg/L}$

Instantaneous Maximum $C_e = 6 + 27 (6 - 0) = 168 \text{ mg/L}$

Residual Chlorine

Daily Maximum $C_e = 0.008 + 27 (0.008 - 0) = 0.224 \text{ mg/L}$

Instantaneous Maximum $C_e = 0.060 + 27 (0.060 - 0) = 1.68 \text{ mg/L}$

2. First Mixing Event Calculation and Final WQBELs

The second step is to calculate the final effluent ammonia as N concentrations allowed by the dilution provided when the West Basin and Hyperion Treatment Plant effluents combine and mix inside the HTP 1-mile outfall. Dilution that occurs during this mixing event utilizes HTP and West Basin flow data, providing a conservative result that protects water quality.

- Hyperion Treatment Plant's lowest monthly average flow value from November 2014 to April 2015 (223 MGD)
- West Basin's maximum discharge flow value during the 2015 Hyperion EPP Project (4.0 MGD)
- The conservative dilution ratio representing the simultaneous low-flow condition from Hyperion Treatment Plant and maximum permitted flow condition from West Basin is thus: 223 MGD : 4.0 MGD, or 55.8:1.
- HTP effluent data was also used to identify the maximum HTP effluent concentration for ammonia in the past 6 months: 46.9 mg/L

These inputs are used to calculate interim WQBELs for ammonia during the 2015 Hyperion EPP Project, which consider the dilution provided by the two mixing events. The Ocean Plan formula, $C_e = C_o + D_m (C_o - C_s)$, is again used, but the variables are revised to account for the dilution that occurs inside the HTP 1-mile outfall. C_o is set equal to the previously calculated effluent concentrations allowed by the 27:1 dilution for the HTP 1-mile outfall. D_m is set equal to the dilution factor (55.8) calculated for the first mixing event. C_s is set equal to the critical background concentration for ammonia calculated for the Hyperion Treatment Plant effluent (44.8 mg/L).

Ammonia

Daily Maximum $C_e = 67.2 + 55.8 (67.2 - 44.8) = 1320 \text{ mg/L}$

Instantaneous Maximum $C_e = 168 + 55.8 (168 - 44.8) = 7040 \text{ mg/L}$

The Regional Water Board, in a public hearing, heard and considered all testimony pertinent to this matter. All Orders referred to above, Regional Water Board files on this matter, and records of hearings and testimony therein are included in the administrative record for this matter.

THEREFORE, BE IT RESOLVED THAT:

1. In the event that West Basin fails to comply with the Order No. R4-2012-0026 or any conditions of the anticipated bypass as referenced in this resolution, the Executive Officer may pursue an enforcement action against the City.
2. If the 1 week contingency time as referenced in Finding No. 5 is not adequate due to unforeseen circumstances, the City shall make a written request to the Executive Officer requesting additional time to complete the 2015 EPP Project. The request shall include the amount of additional time required to complete the work and justification for why the additional time is required. The request for additional time may be granted or denied through modification of this resolution by the Regional Water Board or its Executive Officer.
3. The Regional Water Board conditionally approves the anticipated bypass of the brine from the 5-mile outfall for diversion into the 1-mile outfall for a 6-week period in the fall of 2015 to repair and replace sections of the effluent pumping plant header, provided that West Basin implements mitigation measures, including but not limited to, the following conditions and provided that no impacts to the beneficial uses of the receiving water are caused by the discharges.
 - a. The discharge of brine waste during the 2015 Hyperion EPP Project shall be limited to a maximum of 4.0 MGD and shall be temporarily bypassed from Hyperion's 5-mile outfall to the 1-mile outfall located at 33° 55' 06" N and 118° 26' 51" W.
 - b. During the 2015 Hyperion EPP Project, the diversion of HTP's disinfected secondary treated wastewater from the 5-mile outfall to the 1-mile outfall is necessary for essential maintenance to ensure efficient operation of the Hyperion treatment plant. While the brine waste is diverted to the 1-mile outfall, where it is combined with the HTP effluent and discharged via HTP's Discharge Point 001, the Discharger shall maintain compliance with interim limits for ammonia as Nitrogen (N) and chlorine residual. The interim limitations for ammonia as N and chlorine residual during the 2015 Hyperion EPP Project are listed below in Table 2 with compliance measured at Monitoring Location EFF-001 for ammonia and at Hyperion's End-of-Pipe for Discharge Point 001 (1-mile outfall) for residual chlorine, as described in Resolution No. R15-008. Sampling at Hyperion's End-of-Pipe monitoring point shall be conducted by Hyperion staff or contracted employees.

Table 2. Interim Limitations during 2015 Hyperion EPP Project ≤ 4 MGD

Parameter	Units	Interim Limitations ^a	
		Maximum Daily	Instantaneous Maximum
Chlorine Residual	mg/L	0.22	1.7
	lbs/day ^b	7.5	56
Ammonia as N	mg/l	1320	7040
	lbs/day ^b	44,000	234,900

a – Interim limitations are based on water quality objectives listed in Table 1 of the Ocean Plan. The mixing zone (defined as 200 meters from discharge point 002) with a dilution ratio of 27:1 was used to calculate the interim limitations for these constituents and the additional dilution of 55.8:1 from the HTP effluent was used to calculate the interim limitations for Ammonia as N. The 27:1 dilution ratio was selected based on the *Hyperion Treatment Plant 1-Mile Outfall Dilution Study 250 MGD Evaluation* conducted in June 2015 and the 55.8:1 ratio was calculated from the minimum flow rate from the HTP during the past 6 months (223 MGD) and Hyperion's maximum ammonia as N concentration (44.8 mg/L).

b The mass emission rates are based on the average dry weather flow rate of 4.0 MGD: lbs/day = 8.34 x Ce (effluent concentration in mg/L) x Q (flow rate in MGD).

c. During the 2015 Hyperion EPP Project, the Discharger shall monitor chlorine residual and ammonia as N at Monitoring Location EFF 001. The chlorine residual monitoring requirements specified in Table 3 below are for monitoring only. The compliance monitoring for the chlorine residual is noted below in Table 4.

Table 3. Effluent Monitoring at EFF 001 during 2015 Hyperion EPP Project ≤ 4.0 MGD

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Total Residual Chlorine	mg/L	Grab	2 to 4 times per week ^c	Refer to 40 CFR part 136
Ammonia as N	mg/L	24 hr composite	Weekly	

c – Frequency of the Total Residual Chlorine sampling requirement at Monitoring Location EFF-001 shall be revised to daily if the concentration exceeds 4.5 mg/L.

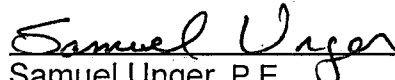
d. During the temporary bypass of the 2015 Hyperion EPP Project, the Discharger shall monitor the total residual chlorine of the brine waste effluent to the Hyperion 1-mile outfall End-of-Pipe. This monitoring for compliance with the interim limitations for chlorine residual may be conducted jointly by the West Basin Municipal Water District and City of Los Angeles (i.e., duplicate monitoring is not required). The interim monitoring requirements for chlorine residual during the 2015 Hyperion EPP Project are listed in Table 4 with compliance measured at the end of the 1-mile outfall as described in Resolution R15-008.

Table 4. Interim Monitoring for Hyperion's 1-mile – End-of-Pipe during 2015 Hyperion EPP Project ≤ 4.0 MGD

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Total Residual Chlorine (HTP 1-mile Discharge Point 001 End-of-Pipe)	mg/L	Grab (As per Resolution No. R15-008, sampling station shall be located at the water surface at the terminus of the 1-mile outfall)	2 to 4 times per week	Refer to 40 CFR part 136

4. The Discharger is required to submit a 2015 Hyperion Effluent Pumping Plant Header Replacement Project Report that includes the results of the monitoring requirements noted above as well as a compliance discussion of the all of the conditions enclosed herein, including the interim limitations for ammonia as N and chlorine residual. This report shall be submitted no later than April 1, 2016.
5. The Executive Officer is hereby authorized to submit a copy of this Resolution to West Basin, the State Water Resources Control Board, the USEPA, other interested parties, and all who may request a copy.

I, Samuel Unger, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Los Angeles Region, on September 10, 2015.



Samuel Unger, P.E.
Executive Officer