

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2002-0128

NPDES NO. CA0083861

WASTE DISCHARGE REQUIREMENTS
FOR
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

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

1. Aerojet-General Corporation (hereafter Discharger) submitted a Report of Waste Discharge, dated 27 September 2001 and supplemental information dated 20 November 2001, and applied for a revision of its authorization to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from the American River Study Area (ARSA) Groundwater Extraction and Treatment System. The application requested authorization to add the discharge from the Groundwater Extraction and Treatment (GET) E/F facility to that from the existing ARSA facility.
2. The Discharger operates a rocket-testing and chemical manufacturing facility in eastern Sacramento County near Rancho Cordova and Folsom. Past discharge practices have caused the release of contaminants into the vadose zone and groundwater at the facility.
3. Concentrations of contaminants in the groundwater northwest of the Discharger's property in the vicinity of Sailor Bar Park and the Nimbus Fish Hatchery, north and south of the American River and west of Hazel Avenue (American River Study Area), respectively, include up to 4000 micrograms per liter ($\mu\text{g/l}$) trichloroethylene (MCL of 5 $\mu\text{g/l}$), 220 $\mu\text{g/l}$ cis-1,2-dichloroethylene (MCL of 6.0 $\mu\text{g/l}$), 110 $\mu\text{g/l}$ 1,1-dichloroethylene (MCL of 5.0 $\mu\text{g/l}$), and 36 $\mu\text{g/l}$ tetrachloroethylene (MCL of 5 $\mu\text{g/l}$). Concentrations of trichloroethylene in the plume of contaminated groundwater have been detected north of Sailor Bar Park exceeding 100 $\mu\text{g/l}$. This plume of contaminated groundwater is extracted and treated by the ARSA facility. The Discharger has been extracting and treating groundwater at ARSA, and discharging the treated groundwater pursuant to an NPDES permit, since 1996.

AMERICAN RIVER STUDY AREA

4. The current plume of contaminated groundwater off the Discharger's property and to the north of the American River creates or threatens to create a condition of pollution or nuisance. In response, the Executive Officer issued Cleanup and Abatement Order No. 95-715 requiring the Discharger to submit a plan designed to minimize the flux of contaminated groundwater past the northern

WASTE DISCHARGE REQUIREMENTS
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

-2-

boundary of Sailor Bar Park while an evaluation and construction of a system for containment, extraction, and treatment of the entire plume in the American River Study Area was being made.

To comply with the Cleanup and Abatement Order, the Discharger submitted a plan proposing to initially extract approximately 500 gpm of groundwater from three existing groundwater extraction wells, treat the water using granular activated carbon (GAC), and discharge the treated groundwater under a permit into the Sacramento Regional County Sanitation District's collection system. However, the costs for discharge to the sewer were significant prompting the Discharger to request to discharge the treated groundwater under an NPDES permit to an existing pond in Sailor Bar Park. The pond was being fed by storm and urban runoff from a small upstream watershed and by a groundwater supply well near the pond. The Board adopted an NPDES permit, Order No. 96-066, for the discharge from the interim treatment plant to the pond in Sailor Bar Park. Water quality of the discharge was no worse, and was generally better due to treatment, than the other discharges into the pond. Overflow from the pond is to an unnamed tributary to the American River. Given the very coarse soils in the drainage channel, and the numerous road crossings blocking flow, and ponding areas, a direct discharge from the pond does not reach the American River. See Attachment A, a part of this Order.

5. The interim groundwater treatment system consisted of twenty-four GAC absorber vessels each containing 2000 pounds of carbon and operated in twelve sets of two vessels in series. The plant was designed to treat 500 gpm of extracted ground water to concentrations below that which can be detected. Prior to entering the GAC vessels, the water will passed through bag filters to remove suspended particles larger than 5 microns. The discharge was in substantial compliance with the effluent and receiving water limitations found in Order No. 96-066 during its period of operation, which ceased in October 1997 to allow construction of the current system. The new system is to treat extracted groundwater from all the extraction wells in the American River Study Area (discussed further below). Order No. 98-113 revised the requirements of Order No. 96-066 to reflect the new treatment plant with discharge to Buffalo Creek.
6. The Board modified Order No. 95-715 with the adoption of Cleanup and Abatement Order No. 96-230 on 20 September 1996. Order No. 96-230 directs the Discharger to complete design, construction, and operation of a groundwater extraction system in the American River Study Area to contain and cleanup the plume of contaminated groundwater. The Discharger complied with that Order by completing construction of a treatment facility on the Discharger's property capable of treating 3500 gpm. Flow from nine extraction wells in Sailor Bar Park is pumped under the American River, combined with flows from six extraction wells on the south side of the river, and piped back to the treatment facility. The new facility came on-line in April 1998 and discharged pursuant to the NPDES permit contained in Order No. 98-113.

The treatment plant utilizes ultraviolet/peroxide oxidation and air stripping to remove the volatile organic contaminants (VOCs), as described in Finding No. 3, above.

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
 AEROJET-GENERAL CORPORATION
 INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
 AMERICAN RIVER STUDY AREA AND GET E/F
 SACRAMENTO COUNTY

7. Sacramento County Department of Parks and Recreation has requested the Discharger to continue the discharge of groundwater to Sailor Bar Park pond (in Section 17, R6E, T9N, MDB&M). It was found that the continuous discharge of freshwater to the pond from the interim system, enhanced the quality of the pond. If the current park well was utilized to provide the flow for the pond, a treatment system would be required for the well since samples of water from the well have found up to 85 µg/l trichloroethylene (TCE). A treatment system consisting of activated carbon canisters has been provided for removal of the TCE prior to discharge to the pond. The treatment system has shown to be effective in removing the TCE to non-detectable levels during its entire operational period. This permit requires monitoring of the water supply well treatment system. The 250 gpm flow from the water supply well will be intermittent, and will have a maximum flow of 0.18 million gallons per day (mgd).
8. The current discharge from the ARSA system consists of the main flow from the groundwater treatment plant to Buffalo Creek on the Discharger's property and the flow to the pond as described in Finding No. 7, above. Buffalo Creek discharges to the American River just upstream of the Sunrise Bridge crossing in Section 13, R6E, T9N, MDB&M. See Attachment A.
9. The Report of Waste Discharge for the ARSA facility, including data from sampling of the Sailor Bar park system and nearby groundwater wells, describes the discharge as follows:

Monthly Average Flow:	5.0 mgd
Daily Peak Flow:	5.0 mgd
Design Flow:	5.0 mgd
Average Temperature:	70°F summer; 59°F winter
pH	7.2 - 8.5

<u>Constituent</u>	<u>mg/l</u>
COD	<3
Total Suspended Solids	<6
Chlorides	40
Sulfate	12
Manganese	0.07
Aluminum	<0.16
Zinc	0.034
Arsenic	<0.002
Lead	<0.005
Hardness (as CaCO ₃)	110
Barium	0.07
Copper	<0.0015

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

-4-

Chromium	<0.002
Nickel	<0.005
All Volatile Organic Contaminants	<0.0005
Perchlorate	0.008

10. Sampling for perchlorate in groundwater monitor wells in the American River Study Area was recently conducted. Concentrations ranged from non-detect (<0.004 mg/l) to 0.150 mg/l. The average concentration was 0.007 mg/l with a median of non-detect (<0.004 mg/l). The highest concentrations of perchlorate are found in the monitor wells closest to Aerojet and all wells with detections, except one, were found on the south side of the American River. Using values from monitor wells closest to the extraction wells, it is calculated that the influent to the treatment system is estimated to be around 0.007 mg/l. This is near the current Department of Health Services (DHS) Action Level for drinking water of 0.004 mg/l (January 2002) and the draft California Public Health Goal of 0.006 mg/l (Office of Environmental Health Hazard Assessment, March 2002). Sampling of the effluent from the ARSA facility since 1998 has shown that the concentration of perchlorate is in the range of 0.005-0.008 mg/l. It should be noted that there will be a minimum 30-fold dilution in the American River (flow at 250 cubic feet per second) at the maximum discharge rate of 3450 gpm, resulting in no detectable concentrations of perchlorate in the American River. The added expense of treatment to remove perchlorate is not justified for the American River Study Area facility.
11. One other contaminant of concern, other than those discussed above, which was deemed necessary for evaluation is 1,4-dioxane. This contaminant is found in some of the groundwater monitor wells south of the American River in the American River Study Area, with a maximum concentration of 0.029 mg/l. Estimated worst-case effluent concentrations for 1,4-dioxane are 0.003 mg/l. The UV/peroxide treatment system provides effective treatment for the reduction of 1,4-dioxane. For 1,4-dioxane, the California State Action Level is 0.003 mg/l and the Proposition 65 value is 0.015 mg/l. The effluent limitation is set at Action Level.
12. Another contaminant of concern is N-Nitrosodimethylamine (NDMA) which has been found in groundwater on the eastern side of Aerojet and a few wells on the western edge of Aerojet. There are no known source areas for NDMA in the vicinity or upgradient of the American River Study Area. In addition, NDMA has not been detected in monitor wells in the American River Study Area. This permit requires monitoring for NDMA in the treatment facility and in the American River upstream and downstream of the confluence with Buffalo Creek.
13. The Discharger submitted a Final Revised Engineering Evaluation and Cost Analysis for the American River Study Area dated 13 September 1996, a draft Quality Assurance Project Plan dated 31 January 1998, a draft revised Sampling and Analysis Plan dated 31 January 1998, and a draft Groundwater Extraction and Treatment System Effectiveness Evaluation Work Plan dated

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

-5-

31 January 1998. These documents were utilized in formulating the initial Order(s).

14. The Final Revised Engineering Evaluation and Cost Analysis (EE/CA) of the American River Study Area evaluated several discharge options for the treated groundwater, including providing the water for municipal and industrial use. The method of discharge covered in this permit as an interim solution, and the Discharger may utilize options considered in the EE/CA in the future. This permit would be modified as necessary.

PERMIT MODIFICATIONS – GET E/F

15. The Discharger has been operating the GET E and F extraction and treatment facilities since 1984. Operation of the GET E and F treatment facilities has been subject to the requirements of the Partial Consent Decree since its entry by federal district court in December 1989. Groundwater extracted from the separate GET E and GET F areas was combined in 2000 and is treated at a modified combined GET E/F treatment facility. The GET E/F extraction system is intended as an interim remedial measure to intercept groundwater pollution plumes prior to the plumes moving beyond the western boundary of the Discharger's property. Currently, the GET E/F treatment facility extracts and treats approximately 3600 gpm, but is being expanded to achieve an extraction and treatment capacity of 6000 gpm to achieve more complete capture of the groundwater plumes.
16. Current disposal of the GET E/F treated groundwater is by discharge to land, recharging the aquifer. However, the final remedy for the Western Groundwater Operable Unit selected in the Record of Decision (ROD) issued by USEPA in July 2001 includes the GET E/F facility and requires discharge of treated groundwater to surface water. In addition there is currently no infrastructure that would allow for subsequent reuse of the treated groundwater to provide replacement water supplies for those lost due to the pollution in groundwater caused by the Discharger in the Rancho Cordova and surrounding areas. The Discharger is required in this permit to evaluate and make appropriate recommendations for reuse alternatives.

The Discharger evaluated other alternatives to discharge of the treated groundwater to surface water, such as land disposal and reuse, and determined that the alternatives were not feasible at this time. Infiltration capacity necessary for land disposal is limited. At the current application rate to land of 3600 gpm, the water is ponding in the area of discharge and not adequately infiltrating. Increasing the application rate to land to 6000 gpm would result in more ponding and, therefore, is not feasible. Further, the remedy selected in the ROD issued by USEPA in July 2001 requires that treated groundwater from the GET E/F facility be discharged to surface water and the extraction system is not designed to include hydraulic conditions caused by the infiltration of the extracted groundwater upgradient of the extraction field. In addition, the Department of Health Services (DHS) and local water purveyors object to the continued recharge of the GET E /F treated ground water to land. (See DHS/water purveyor comments on the Record of Decision and RI/FS.) Another disposal/reuse alternative such as direct reuse of the treated ground water for potable purposes has not been

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

-6-

approved by DHS at this time. In addition, there currently is no demand, or infrastructure that would allow, for reuse of the water for non-potable purposes. The Discharger is required in this permit to evaluate and make appropriate recommendations for reuse alternatives (see Finding No. 23 and Provision E.10).

17. The Discharger proposes to discharge the groundwater treated by the GET E/F facilities to Buffalo Creek, tributary to the American River. Until it is feasible for the GET E/F treated groundwater to be reused, discharge to the American River for a limited duration is a reasonable use of the treated groundwater on an interim basis since it implements the goals of cleaning up the aquifer, restoring its beneficial uses, and preventing additional public supply wells from being polluted as other alternatives are considered.
18. The Basin Plan includes a Wastewater Reuse Policy that encourages the reclamation and reuse of wastewater, including treated groundwater resulting from a cleanup action, where practicable. Those reuse options include municipal and industrial supply, crop irrigation, groundwater recharge, and wetland restoration. At this time, a demonstrated cost-effective option that provides for reuse of the treated groundwater has not been identified. However, given the existing groundwater pollution affecting current and future groundwater supplies, the highest priority for this treated groundwater is the replacement of lost water supplies, unless other sources are demonstrated to be readily available. Several other potential reuse options that could prove applicable in the future should also be evaluated. The Discharger is required in Provision No. 10 to evaluate reuse options and submit a technical report including the evaluation and appropriate recommendations for reuse options to the Executive Officer.
19. The project has a potential effect on the sustainable yield of the groundwater basin from which the GET E/F extraction field takes its water. The Regional Board has addressed this potential effect by evaluating alternatives to allowing the proposed discharge. No feasible alternative to the proposed project exists at this time. Neither reuse nor reinjection of the treated groundwater is feasible at this time. Neither direct nor indirect reuse is feasible at this time and the Regional Board does not have the authority to direct the manner of compliance (e.g., to direct reinjection or reuse of the treated groundwater). The alternative of not allowing the proposed discharge to surface waters exists but poses serious environmental consequences because it would impede the cleanup of the groundwater. Pursuant to California Water Code Sections 13267 and 13383, Provisions 10 and 11 require the Discharger to submit technical reports evaluating whether there are impacts on the sustainable yield of the groundwater basin caused by the permitted activity and evaluating potential direct and indirect reuse options for the discharged water. The required evaluations will allow the Regional Board to determine whether there are additional environmental impacts of the Discharger's pumping and will encourage the reuse of treated groundwater consistent with the Wastewater Reuse Policy set forth in the Basin Plan.

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

20. The groundwater contaminant plumes intercepted by the GET E/F extraction field include VOCs (primarily TCE), perchlorate, and NDMA.
21. The GET E/F facility uses biological reduction to remove perchlorate, ultraviolet light to remove NDMA, and air stripping to remove VOCs. The GET E/F facility has been in operating in its current configuration since 2000. The treatment process has been shown to be effective in removing VOCs to below detection levels (0.5 µg/l), perchlorate to below 4 µg/l, and NDMA to below detection (0.002 –0.0075 µg/l). Testing of the influent and effluent to the treatment facility for full-scan analysis, including tentatively identified compound analysis, did not indicate additional contaminants of concern. A schematic of the treatment facility is included in this Order as Attachment B.
22. Initial discharge of the treated groundwater will be to Buffalo Creek. Later, the effluent from the GET E/F facility may also be discharged to Alder Creek, tributary to Lake Natoma (American River), on the Discharger’s property. These two discharge locations are shown on Attachment A. A pipeline to convey the treated water from the GET E/F facility will need to be constructed prior to the discharge to Alder Creek. The Discharger is currently evaluating pipeline alternatives that would allow discharge to Alder Creek. The interim discharge to Buffalo Creek will co-mingle with the discharge from the ARSA facility, prior to leaving the Discharger’s property.
23. The Report of Waste Discharge for the GET E/F, describes the discharge as follows:

Monthly Average Flow:	8.64 mgd
Daily Peak Flow:	8.64 mgd
Design Flow:	8.64 mgd
Average Temperature:	64°F summer; 60°F winter
pH	7.2 - 7.5

<u>Constituent</u>	<u>mg/l</u>
COD	<3
Total Suspended Solids	<5
Nitrate	<0.05
Chlorides	6.6
Sulfate	15
Manganese	0.07
Aluminum	<0.05
Zinc	<0.10
Arsenic	<0.002
Lead	<0.10
Hardness (as CaCO ₃)	110

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

-8-

Barium	0.1
Copper	<0.01
Chromium	<0.01
Nickel	<0.04
All Volatile Organic Contaminants	<0.0005

24. In the process of removing perchlorate, alcohol is added to the water to provide sufficient food source for biological growth. Excess alcohol is minimized, however, the low concentrations of excess alcohol react with the peroxide used in the NDMA destruction process and low concentrations of acetaldehyde and formaldehyde are formed. Concentrations of those two chemicals have been detected in the effluent from the air-stripper at concentrations up to 2 µg/l for acetaldehyde and 50 µg/l formaldehyde. Those concentrations are below the lowest adverse risk levels found of 380 µg/l (IRIS) and 100 µg/l (State of California Action Level). Effluent limitations are set at 5 for acetaldehyde and 50 µg/l for formaldehyde. In addition, it is also believed that those chemicals will be further reduced during transit to the discharge point and in the upper stretches of Buffalo Creek. Further sampling will be conducted to verify this hypothesis.

Other

25. USEPA adopted the *National Toxics Rule* on 5 February 1993 and the *California Toxics Rule* on 18 May 2000. These Rules contain water quality standards applicable to this discharge. The State Water Resources Control Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan), which contains guidance on implementation of the *National Toxics Rule* and the *California Toxics Rule*.
26. The Board adopted the *Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.
27. The Basin Plan adopted by the Board includes a Wastewater Reuse Policy encourages the reclamation and reuse of wastewater, including treated groundwater resulting from a cleanup action, where practicable. Those reuse options include municipal and industrial supply, crop irrigation, groundwater recharge, and wetland restoration. At this time demonstrated cost-effective options that proved for reuse of the treated groundwater have not been identified. However, given the exiting groundwater contamination affecting current and future groundwater supplies, the highest priority for this treated groundwater is the replacement of lost water supplies, unless other sources are readily available. Several other potential reuse options that could prove applicable in the future

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

-9-

should also be evaluated. The Discharger is required in Provision No. 10 to annually evaluate reuse options and develop a report to the Executive Officer regarding the evaluation.

28. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numeric water quality standard. Based on information submitted as part of the application and from past monitoring, the Board finds that the proposed discharge has a reasonable potential to exceed standards and objectives for the constituents discussed in the Information Sheet for the following constituents:
- a. VOCs: cis-1,2-dichloroethene, cis-1,2-dichloroethane, 1,1-dichloroethylene, chloroform, trichloroethene, and trans-1,2-dichloroethene; and effluent limitations for the constituents have been included in this Order. The two treatment systems have been designed, constructed, and have shown capable of meeting the effluent limitations.
 - b. Non-VOCs: 1,4-dioxane, formaldehyde, acetaldehyde, perchlorate, and n-nitrosodimethylamine; and effluent limitations for the constituents have been included in this Order.
 - c. This Order and the Basin Plan prohibit the discharge of toxic constituents in toxic amounts. Based on information submitted as part of the application and monitoring reports, VOCs: 1,2-dichloroethane, chloroform, cis-1,2-dichloroethene, trichloroethene, and trans-1,2-dichloroethene in the discharge, have a reasonable potential to cause or contribute to a violation of the Basin Plan narrative prohibition of the discharge of toxic substances in toxic concentrations. The Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule (California Toxics Rule) is promulgated in the Federal Register, 40CFR Part 131, Part III. Effluent limitations for VOCs: 1,2-dichloroethane, chloroform, cis-1,2-dichloroethene, trichloroethene, and trans-1,2-dichloroethene, based on the California Toxics Rule and Best Available Technology (as described above), are included in this Order.
29. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality objective. This Order contains provisions that:
- a. require the Discharger to provide information as to whether the levels of priority pollutants, including CTR and NTR constituents, and constituents for which drinking water maximum contaminant levels (MCL) are prescribed in the California Code of Regulations, and temperature in the discharge cause or contribute to an in-stream excursion above a water quality objective;
 - b. if the discharge has a reasonable potential to cause or contribute to an in-stream excursion

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

-10-

above a water quality objective, require the Discharger to submit information necessary to calculate effluent limitations for those constituents; and

- c. allow the Board to reopen this Order and include effluent limitations for those constituents.
30. The U.S. Environmental Protection Agency (EPA) and the Board have classified this discharge as a major discharge.
31. The beneficial uses of the American River downstream of the discharge are municipal and domestic, industrial, and agricultural supply; water contact and noncontact recreation; groundwater recharge, fresh water replenishment; and preservation and enhancement of fish, wildlife and other aquatic resources.
32. The beneficial uses of the underlying groundwater are municipal and domestic, industrial, and agricultural supply.
33. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on water quality will be insignificant.
34. Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 301, 302, 304, and 307 of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.
35. The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21100, et seq.), in accordance with Section 13389 of the California Water Code.
36. The Department of Toxic Substances Control has certified a final Negative Declaration and Initial Study for the American Rivers Study Area project in accordance with the CEQA (Public Resources Code Section 21000, et seq.), and the State CEQA Guidelines. The Board has reviewed the Negative Declaration and these waste discharge requirements will mitigate or avoid any significant impacts on water quality due to the discharges from the American River Study Area treatment system.
37. The Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
38. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
 AEROJET-GENERAL CORPORATION
 INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
 AMERICAN RIVER STUDY AREA AND GET E/F
 SACRAMENTO COUNTY

39. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect upon the date of hearing, provided EPA has no objections.

IT IS HEREBY ORDERED that Order No. 98-113 is rescinded and Aerojet-General Corporation, its agents, successors and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Discharge Prohibitions:

1. Discharge of treated wastewater at a location or in a manner different from that described in Finding Nos. 8, 19 and 22 is prohibited.
2. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by the attached Standard Provisions and Reporting Requirements A.13.
3. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.
4. The discharge shall not cause the degradation of any water supply.

B. Effluent Limitations:

1. Effluent from the ARSA facility shall not exceed the following limits:

<u>Constituents</u>	<u>Units</u>	<u>Daily Maximum</u>	<u>Monthly Average</u>
Total Copper	µg/l	17	11
Total Lead	µg/l	15	2.5
Total Zinc	µg/l	110	100
Volatile Organics ¹	µg/l	0.5 ¹	
1,2-Dichloroethane	µg/l	0.5	0.38
Perchlorate	µg/l	18	10
1,4-dioxane	µg/l	10	3

¹ All volatile organic constituents listed in EPA Methods 8010 and 8020. The concentration of each constituent shall not exceed 0.5 µg/l.

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
 AEROJET-GENERAL CORPORATION
 INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
 AMERICAN RIVER STUDY AREA AND GET E/F
 SACRAMENTO COUNTY

2. Effluent from the GET E/F facility shall not exceed the following limits:

<u>Constituents</u>	<u>Units</u>	<u>Daily Maximum</u>	<u>Monthly Average</u>
Total Copper	µg/l	17	11
Total Lead	µg/l	15	2.5
Total Zinc	µg/l	110	100
Volatile Organics ¹	µg/l	0.5 ¹	
1,2-Dichloroethane	µg/l	0.5	0.38
Perchlorate	µg/l	8	4
1,4-dioxane	µg/l	10	3
<u>Constituents</u>	<u>Units</u>	<u>Daily Maximum</u>	<u>Monthly Average</u>
N-nitrosodimethylamine	µg/l	0.005	0.002
Acetaldehyde	µg/l	5	
Formaldehyde	µg/l	50	

¹ Volatile organic constituents listed in EPA Methods 8010 and 8020. The concentration of each constituent shall not exceed 0.5 µg/l.

3. The discharges shall not have a pH less than 6.5 nor greater than 8.5.
4. The 30-day average daily discharge flow shall not exceed 5.04 mgd for the ARSA facility and 8.64 mgd for the GET E/F facility.
5. Survival of aquatic organism in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay - - - - - 70%
 Median for any three or more consecutive bioassays - - - - 90%

C. Sludge Disposal:

1. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of in a manner that is consistent with Chapter 15, Division 3, Title 23, of the CCR and approved by the Executive Officer.
2. Any proposed change in sludge use or disposal practice shall be reported to the Executive Officer and EPA Regional Administrator at least **90 days** in advance of the change.

D. Receiving Water Limitations:

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

-13-

Receiving Water Limitations are site-specific interpretations of water quality objectives from applicable water quality control plans. As such they are a required part of this permit. However, a receiving water condition not in conformance with the limitation is not necessarily a violation of this Order. The Board may require an investigation to determine the cause and culpability prior to asserting that a violation has occurred.

The discharge shall not cause the following in the receiving water:

1. Concentrations of dissolved oxygen to fall below 7.0 mg/l.
2. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.
3. Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.
4. Aesthetically undesirable discoloration.
5. Fungi, slimes, or other objectionable growths.
6. Turbidity to increase more than 20 percent over background levels.
7. The normal ambient pH to fall below 6.5, exceed 8.5.
8. Deposition of material that causes nuisance or adversely affects beneficial uses.
9. The normal ambient temperature to be increased more than 5°F.
10. Taste or odor-producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.
11. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in the California Code of Regulations, Title 22; that harm human, plant, animal or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
12. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

-14-

13. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.
14. Violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board pursuant to the CWA and regulations adopted thereunder.

E. Provisions:

1. The Effluent Limitations for metals found in Effluent Limitation B.1 were conservatively developed, but with only a minimal amount of data. The Discharger shall be collecting additional information during required monitoring that will be used to evaluate the limits. If necessary, this permit may be reopened and the effluent limitations for metals revised based on the new data.
2. The Discharger shall comply with the Operation, Maintenance, and Monitoring Plan, Ground Water Extraction and Treatment System, American River Study Area dated **31 January 1998**. The Discharger shall submit an Operation, Maintenance, and Monitoring Plan for the GET E/F facility no later than **31 August 2002** for Executive Officer approval. The Discharger shall comply with the approved version of the plan.
3. Prior to discharge to Alder Creek, Aerojet shall complete and submit an assessment of the thermal impacts to Alder Creek and the American River from the discharge and verify that the discharge will not cause a violation of receiving water limitation D.9. The discharge to Alder Creek cannot commence until approved by the Executive Officer.
4. The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharge shall submit a work plan to conduct a Toxicity Reduction Evaluation (TRE) and upon approval conduct the TRE, and this Order will be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the State Water Resources Control Board, this Order may be reopened and a limitation based on that objective included.
5. The Discharger shall use the best practicable cost-effective control technique currently available to limit mineralization to no more than a reasonable increment.

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

-15-

6. The Discharger shall comply with all the items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)", dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provision(s)."
7. The Discharger shall comply with the attached Monitoring and Reporting Program No. R5-2002-0128 which is part of this Order, and any revisions thereto, as ordered by the Executive Officer.
8. Under Monitoring and Reporting Program No. R5-2002-0128, the Discharger shall report trace concentrations of constituents found during the analysis of samples. Trace values are estimates of concentrations detected between the detection level and the practical quantitation level. Trace values are not always reliable as there is a potential for interferences below the practical quantitation level. As effluent limitations specified in this permit are at or above the practical quantitation level, reporting trace values shall not be a violation of an effluent limitation. Trace values are to be used to help operate the treatment facility and to provide information to minimize violations of effluent limits."
9. Section 13267(b) of the California Water Code 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." The monitoring and reporting program and technical reports required by this Order and the attached "Monitoring and Reporting Program, Order No. R5-2002-0128" are necessary to assure compliance with these waste discharge requirements. The Discharger operates the facility that discharges the waste subject to this Order.
10. By **1 October 2002** the Discharger shall submit a time schedule for planning, developing, and submitting a technical report that evaluates the direct and indirect reuse of the treated groundwater from the groundwater extraction and treatment systems allowed to discharge under this permit and that makes appropriate recommendations for, reuse of the water, including but not limited to, as municipal and industrial supply, crop irrigation, groundwater recharge, landscape irrigation, and wetland restoration. The Discharger shall submit the report by **1 August 2003**. The Discharger should prepare the report in coordination with the Department of Health Services and local water purveyors, including, but not necessarily limited to Sacramento County Water Agency, California-American Water Company, and American States

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

-16-

Water Company. This permit may be reopened to reflect changes in the discharge, as appropriate.

11. By **1 October 2002** the Discharger shall submit a time schedule for planning, developing, and submitting a technical report that assesses the cumulative impacts on the groundwater basin caused by the withdrawal and export of the groundwater from the GET systems that discharge to surface water under this permit and that evaluates alternatives for addressing significant impacts identified, if any. The Discharger shall submit the report by **1 August 2003**. The Discharger should prepare its report in coordination with the Water Forum, the local water purveyors including, but not necessarily limited to Sacramento County Water Agency, California-American Water Company, and Southern California Water Company, and other responsible parties, other than Aerojet, extracting groundwater to remediate groundwater pollution. The Discharger shall proceed with the preparation of the report in accordance with the schedule upon approval of the Executive Officer.
12. If perchlorate associated with the discharge is found in the American River exceeding 4.0 µg/l, or the current Department of Health Services Action Level or state drinking water standards (i.e., Maximum Contaminant Levels), then the Discharger shall cease the Discharge and the permit shall be reopened to make appropriate modifications to the permit and to the discharge.
13. **Within 24-hours** after the Discharger has received information that their discharge exceeds effluent limitations, the Discharger shall notify the Board, City of Sacramento Department of Utilities, and Carmichael Water District.
14. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger shall obtain approval of or clearance from the State Water Resources Control Board (Division of Water Rights).
15. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall 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.
16. To assume operation 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, address, and telephone number of the persons responsible for contact with the Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision D.6 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. Transfer shall be approved or disapproved in writing by the Executive Officer.

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

-17-

I, THOMAS R. PINKOS, 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 19 July 2002.

THOMAS R. PINKOS, Acting Executive Officer

Revised 07/19/02:AMM

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0128
 AEROJET-GENERAL CORPORATION
 INTERIM GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
 AMERICAN RIVER STUDY AREA AND GET E/F
 SACRAMENTO COUNTY

-18-

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
 CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM

NPDES NO. CA0083861

ORDER NO. R5-2002-0128

FOR
 AEROJET-GENERAL CORPORATION
 GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
 AMERICAN RIVER STUDY AREA AND GET E/F
 SACRAMENTO COUNTY

Specific sample station locations have been established under direction of the Board's staff, and a description of the stations is attached to this Order.

GROUNDWATER TREATMENT SYSTEM MONITORING

Samples shall be collected from the inlet and outlet to the treatment system and analyzed. If the discharge is intermittent rather than continuous, then the samples shall be collected on the first day of the intermittent discharge. The time of collection of samples shall be recorded. The treatment system monitoring shall include at least the following:

American River Study Area Treatment Facility

Constituents	Units	Type of Sample	Sampling Frequency
Dissolved Oxygen	mg/l	Grab	Monthly
Flow ¹	mgd	Grab	Continuous
Total Dissolved Solids	mg/l	Grab	Monthly
Acute Toxicity ^{2,3}		Grab	Quarterly
Volatile Organics ⁴	µg/l	Grab	Monthly ¹⁴
Semi-Volatile Organics ⁵	µg/l	Grab	Monthly ¹⁴
1,4-dioxane ⁶	µg/l	Grab	Monthly
pH ¹	Number	Grab	Monthly
Turbidity	NTU	Grab	Monthly

MONITORING AND REPORTING PROGRAM ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

Constituents	Units	Type of Sample	Sampling Frequency
Temperature ¹	°F (°C)	Grab	Monthly
Electrical Conductivity@25°C	µmhos/cm	Grab	Monthly
Total Copper	mg/l	Grab	Quarterly
Total Lead	mg/l	Grab	Quarterly
Total Zinc	mg/l	Grab	Quarterly
Perchlorate ²	µg/l	Grab	Monthly ¹⁴
N-Nitrosodimethylamine ⁸	µg/l	Grab	Monthly ¹⁴
Hardness as (as CaCO ₃)	mg/l	Grab	Monthly

Footnotes as provided below

GET E/F

Constituents	Units	Type of Sample	Sampling Frequency
Dissolved Oxygen	mg/l	Grab	Monthly
Electrical Conductivity@25°C ¹	µmhos/cm	Meter	Monthly
Flow ¹	mgd	Grab	Continuous
Total Dissolved Solids	mg/l	Grab	Monthly
Acute Toxicity ^{2,3}		Grab	Monthly
Volatile Organics ⁴	µg/l	Grab	Monthly ¹⁴
Semi-Volatile Organics ⁵	µg/l	Grab	Monthly ¹⁴
1,4-dioxane ⁶	µg/l	Grab	Monthly
pH ¹	Number	Grab	Monthly
Turbidity	NTU	Grab	Monthly
Temperature ¹	°F (°C)	Grab	Weekly
Total Copper	mg/l	Grab	Quarterly
Total Lead	mg/l	Grab	Quarterly
Total Zinc	mg/l	Grab	Quarterly
Perchlorate ²	µg/l	Grab	Monthly ¹⁴
N-Nitrosodimethylamine ⁸	µg/l	Grab	Monthly ¹⁴
Hardness as (as CaCO ₃)	mg/l	Grab	Monthly

MONITORING AND REPORTING PROGRAM ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

Constituents	Units	Type of Sample	Sampling Frequency
PROWL ⁹	µg/l	Grab	Twice per year
Formaldehyde ¹⁰	µg/l	Grab	Monthly
Acetaldehyde ¹¹	µg/l	Grab	Monthly
Gloxayl ¹²	µg/l	Grab	Monthly
Ethanol ¹³	µg/l	Grab	Monthly
Iron, Total and Dissolved	µg/l	Grab	Monthly

- 1 Field Measurements.
- 2 The analyses shall be performed in accordance with EPA/600/4-90/027, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*.
- 3 Sampling of Effluent only.
- 4 Test method to be by EPA Methods 601 and 602, or 8010 and 8020, or 8260, or 500 series with a practical quantitation level no greater than 0.5 µg/l. All concentrations between the detection level and practical quantitation level shall be reported as trace.
- 5 Test method to be EPA Method 8270 or equivalent. All peaks shall be reported and tentatively identified. All concentrations between the detection limit and the practical quantitation limit shall be reported as trace values.
- 6 A practical quantitation level of 10 µg/l. All concentrations between the detection level and quantitation level shall be reported as trace.
- 7 A practical quantitation level of 4 µg/l. All concentrations between the detection level and quantitation level shall be reported as trace.
- 8 NDMA analysis with a practical quantitation level no greater than 0.005 µg/l. All concentrations between the detection level and quantitation level shall be reported as trace.
- 9 PROWL analysis with a practical quantitation level no greater than 10 µg/l. All concentrations between the detection level and quantitation level shall be reported as trace.
- 10 Formaldehyde analysis with a practical quantitation level no greater than 5 µg/l. All concentrations between the detection level and quantitation level shall be reported as trace.
- 11 Acetaldehyde analysis with a practical quantitation level no greater than 1 µg/l. All concentrations between the detection level and quantitation level shall be reported as trace.
- 12 Glyoxal analysis with a practical quantitation level no greater than 5 µg/l. All concentrations between the detection level and quantitation level shall be reported as trace.
- 13 Ethanol analysis with a practical quantitation level no greater than 10 µg/l. All concentrations between the detection level and quantitation level shall be reported as trace.
- 14 If the United States Bureau of Reclamation projected flows in the American River fall below 1500, then the sampling shall be weekly for that period. Aerojet shall supply the projections with the monthly Monitoring Report to justify the sampling conducted.

Note: All metals analyses shall be by atomic adsorption methods or a method with an equivalent practical quantitation limit, or a method achieving equivalent or lower practical quantitation levels. In addition, chronic toxicity monitoring for the treatment system is also required, and detailed below.

RECEIVING WATER MONITORING

All receiving water samples shall be grab samples. Receiving water monitoring shall include at least the following:

MONITORING AND REPORTING PROGRAM ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

<u>Station</u>	<u>Description</u>
R-1	At least 100 feet upstream on the American River from the confluence with Buffalo Creek.
R-2	Downstream on the American River at the pedestrian bridge crossing just downstream of the Sunrise Bridge overcrossing.

<u>Station</u>	<u>Description</u>
R-3	If discharge is occurring to Alder Creek, the sample shall be collected at least 100 feet upstream of the discharge into Alder Creek.
R-4	If discharge to Alder Creek is occurring, then the sample shall be collected approximately 100 feet downstream in Alder Creek.

Constituents	Units	Station	Sampling Frequency
Dissolved Oxygen	mg/l	R-1, R-2, R-3, R-4	Monthly
Electrical Conductivity@25°C	µmhos/cm	R-1, R-2, R-3, R-4	Monthly
Total Dissolved Solids	mg/l	R-1, R-2, R-3, R-4	Monthly
Volatile Organics ¹	µg/l	R-1, R-2, R-3, R-4	Monthly
Semi-Volatile Organics ²	µg/l	R-1, R-2, R-3, R-4	Monthly
pH	Number	R-1, R-2, R-3, R-4	Monthly
Turbidity	NTU	R-1, R-2, R-3, R-4	Monthly
Temperature	°F (°C)	R-1, R-2, R-3, R-4	Monthly
Total Copper	mg/l	R-1, R-2, R-3, R-4	Quarterly
Total Lead	mg/l	R-1, R-2, R-3, R-4	Quarterly
Total Zinc	mg/l	R-1, R-2, R-3, R-4	Quarterly
Perchlorate ³	µg/l	R-1, R-2, R-3, R-4	Monthly
N-Nitrosodimethylamine ⁴	µg/l	R-1, R-2, R-3, R-4	Monthly
Hardness as (as CaCO ₃)	mg/l	R-1, R-2, R-3, R-4	Monthly
Ethanol ⁵	µg/l	R-1, R-2, R-3, R-4	Monthly
1,4-dioxane	µg/l	R-1, R-2, R-3, R-4	Monthly
Iron, Total and Dissolved	µg/l	R-1, R-2, R-3, R-4	Monthly

- ¹ Test method to be by EPA Methods 601 and 602, or 8010 and 8020, or 8260, or 500 series with a practical quantitation level no greater than 0.5 µg/l. All concentrations between the detection level and practical quantitation level shall be reported as trace.
- ² Test method to be EPA Method 8270 or equivalent. All peaks shall be reported and tentatively identified. All concentrations between the detection limit and the practical quantitation limit shall be reported as trace values.
- ³ A practical quantitation level of 4 µg/l. All concentrations between the detection level and quantitation level shall be reported as trace.
- ⁴ NDMA analysis with a practical quantitation level no greater than 0.005 µg/l. All concentrations between the detection level and quantitation level shall be reported as trace.
- ⁵ Ethanol analysis with a practical quantitation level no greater than 10 µg/l. All concentrations between the detection level and quantitation level shall be reported as trace.

Note: All metals analyses shall be by atomic adsorption methods or a method with an equivalent practical quantitation limit, or a method achieving equivalent or lower practical quantitation levels.

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions in the American River. Notes on receiving water conditions shall be summarized in the monitoring report. Attention shall be given to the presence or absence of:

- | | |
|---------------------------------|--|
| a. Floating or suspended matter | e. Visible films, sheens or coatings |
| b. Discoloration | f. Fungi, slimes, or objectionable growths |
| c. Bottom deposits | g. Potential nuisance conditions |
| d. Aquatic life | |

THREE SPECIES CHRONIC TOXICITY MONITORING

Chronic toxicity monitoring shall be conducted to determine whether the effluent is contributing to toxicity in the American River. The testing shall be conducted as specified in EPA 600/4-89-001. Chronic toxicity samples shall be collected at the discharge of the Ground Water Treatment Plant prior to entering Buffalo and/or Alder Creek. One additional test shall be performed on samples collected from Buffalo Creek just prior to leaving the Discharger's property. Samples collected from the outlet of the treatment unit shall be representative of the volume and quality of the discharge. The time of collection for samples shall be recorded. Chronic toxicity monitoring shall include the following:

Species: *Pimephales promelas*, *Ceriodaphnia dubia*, *Selenastrum capriocornutum*

Frequency: Once per quarter for first year, annually thereafter

Dilution Series: 100 percent effluent

MONITORING OF DISCHARGE TO SAILOR BAR PARK

The Discharger shall sample the discharge to pond in Sailor Bar Park for volatile organic constituents and N-Nitrosodimethylamine as listed above in the table for the groundwater treatment system monitoring. The sample shall be collected and analyzed on a monthly basis from the discharge prior to it entering the pond.

REPORTING

Monitoring results shall be submitted to the Regional Board by the **25th day of the month** following sample collection. Quarterly and annual monitoring results shall be submitted by the **25th day of the month** following each calendar quarter and year, respectively.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements.

If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

By **30 January of each year**, the Discharger shall submit a written report to the Executive Officer containing the following:

- a. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.
- b. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.6).

The Discharger may also be requested to submit an annual report to the Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision D.6.

The Discharger shall implement the above monitoring program on the first day of the month following effective date of this Order.

MONITORING AND REPORTING PROGRAM ORDER NO. R5-2002-0128
AEROJET-GENERAL CORPORATION
GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
AMERICAN RIVER STUDY AREA AND GET E/F
SACRAMENTO COUNTY

-24-

Ordered by: _____
THOMAS R. PINKOS, Acting Executive Officer

Aerojet-General Corporation (Aerojet) operates a rocket-testing and chemical manufacturing facility in eastern Sacramento County near Rancho Cordova and Folsom. Past discharges and disposal practices have caused the release of volatile and semi-volatile organic contaminants to groundwater and the vadose zone. One of the contaminated groundwater plumes extends northwest from Aerojet's property underneath the American River, Sailor Bar Park, and beneath the community of Fair Oaks. This area is referred to as the American River Study Area (ARSA). Aerojet has been discharging extracted groundwater from ARSA under an NPDES permit since 1996. Aerojet requested to add an additional discharge from another groundwater extraction and treatment systems, GET E/F, which captures contaminated groundwater in the western portion of the Aerojet facility. The permit for the ARSA discharge is being revised to include the discharge from GET E/F.

American River Study Area

The concentrations of volatile organic contaminants (VOCs) in the groundwater in the American River Study Area include up to 4000 micrograms per liter ($\mu\text{g}/\text{l}$) trichloroethylene (MCL of $5 \mu\text{g}/\text{l}$), $220 \mu\text{g}/\text{l}$ cis-1,2-dichloroethylene (MCL of $6.0 \mu\text{g}/\text{l}$), $110 \mu\text{g}/\text{l}$ 1,1-dichloroethylene (MCL of $5.0 \mu\text{g}/\text{l}$), and $36 \mu\text{g}/\text{l}$ tetrachloroethylene (MCL of $5.0 \mu\text{g}/\text{l}$). Other maximum concentrations of non-volatile contaminants of concern detected in the groundwater are 1,4 dioxane at $29 \mu\text{g}/\text{l}$ and perchlorate at up to $150 \mu\text{g}/\text{l}$. More discussion on these contaminants is found below.

The Board adopted Cleanup and Abatement Order No.95-715 requiring Aerojet to provide interim measures to minimize the flux of groundwater contaminants in the plumes described above while assessing the appropriate means of remediating the plume of contaminated groundwater in the American River Study Area. That interim measure consisted of extracting groundwater from three groundwater extraction wells at the toe of the plume, treating the extracted groundwater using activated carbon in a temporary treatment facility, and discharging the treated water to a pond in Sailor Bar Park. This park is located on the north side of the American River. The discharge was regulated by an NPDES permit, Order No. 96-066. The operation of the plant during its 1.5 years of operation was in substantial compliance with the requirements found in Order No. 96-066.

The Board modified Order No. 95-715 with the adoption of Order No. 96-230, directing Aerojet to complete the design, construction, and operation of a groundwater extraction and treatment system in the American River Study Area to contain and cleanup the plume of contaminated groundwater. Aerojet is complying with that Order by completing construction of a treatment system on Aerojet's property capable of treating a flow of 3500 gpm. Aerojet completed the extraction wells and treatment system and commenced discharge from the treatment system to Buffalo Creek in 1998. Extracted groundwater comes from nine wells in Sailor Bar Park and six wells on the south side of the American River. Additional extraction wells are being constructed to enhance plume containment. The treated effluent is discharged to Buffalo Creek, a tributary of the American River just east of the Sunrise Bridge overcrossing. In addition, the Sacramento County Department of Parks and Recreation requested Aerojet continue the discharge to the pond in Sailor Bar Park that was discontinued with the shutdown of the temporary facility. The water supply well that has been utilized in the past by County Parks for the purpose of maintaining the water level in the pond contains up to $120 \mu\text{g}/\text{l}$ trichloroethylene and would require treatment before discharge to the pond. Aerojet provides treatment on that well using activated carbon, removing the VOCs to below detection levels ($0.5 \mu\text{g}/\text{l}$).

GET E/F

The Discharger has been operating the groundwater extraction systems, GET E and F, since 1984, and according to the requirements of the Partial Consent Decree since its entry by Federal Court in December 1989. Effluent from the GET E and F facilities was either discharged to land or recharged to groundwater via injection wells. GET E and GET F were combined in 2000 with all of the water being treated at a modified GET E/F facility. The GET E/F extraction system is designed to intercept groundwater contaminant plumes prior to them leaving the western portion of the Discharger's property. Currently, the facility operates at approximately 3600 gpm, and is being expanded to achieve a treatment capacity of 6000 gpm. The GET E/F facilities are part of the remedy for the Western Groundwater Operable Unit (WGOU) section of Aerojet. The Record of Decision for the WGOU issued by USEPA in July 2000 does not call for injection, but for discharge of the treated groundwater to surface water in order to allow for the greatest potential for reuse of the treated groundwater to provide replacement water supplies for those lost due to contamination in the Rancho Cordova and surrounding areas. In addition, infiltration capacity in the vicinity is limited as demonstrated by the current ponding of water from the GET E/F discharge of 3600 gpm to land for recharge. Increasing application to land at a rate of 6000 gpm is not feasible.

The groundwater contaminant plumes intercepted by the GET E/F extraction field include VOCs (primarily TCE), perchlorate, and NDMA. The GET E/F facility uses biological reduction to remove perchlorate, ultraviolet light to remove NDMA, and air stripping to remove VOCs. The GET E/F facility has been in operating in its current configuration since 2000. The treatment process has been shown to be effective in removing VOCs to below detection levels (0.5 µg/l), perchlorate to below 4 µg/l, and NDMA to below detection (0.002 –0.075 µg/l). Testing of the influent and effluent to the treatment facility for full-scan analysis, including tentatively identified compound analysis, did not indicate additional contaminants of concern.

Initial discharge of the treated groundwater will be to Buffalo Creek. Later, the effluent from the GET E/F facility may also be discharged to Alder Creek, tributary to Lake Natoma (American River), on Aerojet's property. A pipeline to convey the treated water from the GET E/F facility will need to be constructed prior to the discharge to Alder Creek. Aerojet is currently evaluating pipeline alternatives that would allow discharge to Alder Creek. The interim discharge to Buffalo Creek will co-mingle with the discharge from the ARSA facility, prior to leaving the Discharger's property.

Reasonable Potential and Anti-degradation Analyses

A reasonable potential analyses for priority pollutants, utilizing guidance covered by the Policy for the Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP), adopted in March 2000 by the State Board, was conducted based upon data submitted by the Discharger regarding effluent concentrations of volatile organic compounds.

The numeric water quality criteria for priority pollutants were promulgated by U.S. EPA with the adoption of the *National Toxics Rule* on 5 February 1993 and the *California Toxics Rule* on 18 May 2000. The reasonable potential analysis for Trichloroethene, 1,2-Dichloroethane, Chloroform, cis-1, 2-Dichloroethene, revealed that these constituents may exceed numeric water quality criteria, and require limits. Limits were not included for those detected constituents where there is no reasonable potential to exceed a standard.

Additionally, federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have a reasonable potential to cause, or contribute to an in-stream excursion above numerical or narrative water quality standard. The Discharger is required to provide information as to whether the levels of priority pollutants, including CTR and NTR constituents, and constituents for which drinking water maximum contaminant levels prescribed in the California Code of Regulations, in the discharge cause or contribute to an in stream excursion above a water quality objective. If the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a water quality objective, the Discharger is required to submit information to calculate effluent limitations for those constituents.

Effluent Limits

The following water quality limits have been selected to implement all applicable water quality objectives for the protection of Board-designated beneficial uses of surface water in the American River downstream of the discharge point(s):

Volatile Organic Compounds

Both the ARSA and GET E/F treatment facilities utilize air stripping and ultraviolet/peroxide oxidation to remove the volatile organics from the extracted groundwater to concentrations less than the quantitation limit of 0.5 µg/l (the effluent limitation for these constituents). The 0.5 µg/l value for the volatile organic constituents are below the respective maximum contaminant levels (Primary and Secondary Drinking Water Standards) for the individual volatile organic contaminants. One chemical of concern, 1,2-Dichloroethane has a CTR value less than 0.5 µg/l and so its monthly average is set at that concentration. The effluent limits are based on Best Available Technology utilizing either air stripping or carbon adsorption which have been demonstrated to readily reduce volatile organics to below 0.5 µg/l.

1,4-Dioxane Limitation

The treatment systems at ARSA and GET E/F utilize ultraviolet light/peroxide which has been demonstrated to effectively remove 1,4-dioxane. The calculated concentrations of 1,4-dioxane entering and exiting the ARSA treatment plant are 6 µg/l and 3 µg/l, respectively. These are below the practical quantitation level of 10 µg/l and the Proposition 65 value of 15 µg/l. Sampling of the effluent from the facility has not shown detectable concentrations of 1,4-dioxane. The effluent limitations have been set at the practical quantitation level for the monthly average value and the Proposition 65 value for the daily maximum. It should also be noted that there will be a minimum 30-fold dilution in the American River (flow at 250 cubic feet per second) at the maximum discharge rate of 3450 gpm.

Only very low concentrations (3 to 5 µg/l) of 1,4-dioxane have been detected in the influent to the GET E/F facility. The facility has been shown to effectively remove these low concentrations to below 3 µg/l.

Perchlorate Limitation

The current Action Level (January 2002) set by the Department of Health Services -Office of Drinking Water as its recommended value not to be exceeded in a drinking water supply, is 4 µg/l. In March 2002, the California Department of Health Hazard Assessment released a draft Public Health Goal for perchlorate of 6 µg/l. For the ARSA facility, the calculated value that could eventually be found in the influent to the treatment plant is 8 µg/l

(the current influent concentrations range between 5 and 7 µg/l). The previous version of this permit established the effluent limitation for perchlorate at 18 µg/l, the Action Level for perchlorate at the time of adoption of the permit. Given the minimum 30-fold dilution in the American River, the low influent perchlorate concentration, and the additional mixing with the GET E/F effluent, this permit does not establish a revised effluent limitation for perchlorate.

The GET E/F influent concentration of perchlorate is approximately 3000 µg/l. The GET E/F treatment facility has been shown to be capable of reducing the perchlorate concentration to less than the practical quantitation level of 4 µg/l. The effluent limitation is established at 4 µg/l based on the ability to reduce the concentration to at or below the Action Level.

NDMA Limitation

N-Nitrosodimethylamine (NDMA), a contaminant not suspected in the American River Study Area, but found in the groundwater at the eastern end of Aerojet and in March 1998 in wells at the western end of Aerojet, is required to be sampled and analyzed for in the permitted discharges and receiving water. To date, no NDMA has been found within the extraction area for ARSA. There are no known source areas for NDMA in the vicinity or upgradient of the American River Study Area. Additional sampling of groundwater monitor wells in the American River Study Area for NDMA will occur on a periodic basis.

The GET E/F facility was designed to remove NDMA to concentrations no greater than 0.002 µg/l, the estimated excess one-in-a-million cancer risk value established by the Office of Environmental Health Hazard Assessment. The effluent limitation is established at 0.002 µg/l.

Other

Analysis for metals in samples collected from the groundwater monitoring system and extraction wells and influent to the treatment system were used to assess which metals may be of concern. This analysis found only three metals of concern that were detected, or are currently of potential concern in the American River. Those metals are copper, lead, and zinc. The effluent limitations for those metals were established based on protection of aquatic life, with no dilution. The values utilize a hardness of 100 mg/l and Ambient Water Quality Criteria, which is based on data collected from the groundwater and treatment systems. The detected values in the groundwater for those three metals are below the effluent limitations established in this permit.

The following tables provide the rationale for the effluent limits.

Table 1: Monthly Average Limit

Constituent	Monthly Average Limit	Units	Reference
Trichloroethene ¹	0.5	µg/l	Non-detect, Best Practicable Treatment
1,2-Dichloroethane ¹	0.38	µg/l	California Toxics Rule
Chloroform ¹	0.5	µg/l	Non-detect, Best Practicable Treatment
cis-1, 2-Dichloroethene ¹	0.5	µg/l	Non-detect, Best Practicable Treatment

MONITORING AND REPORTING PROGRAM ORDER NO. R5-2002-0128
 AEROJET-GENERAL CORPORATION
 GROUNDWATER EXTRACTION AND TREATMENT SYSTEM
 AMERICAN RIVER STUDY AREA AND GET E/F
 SACRAMENTO COUNTY

Dichloromethane ¹	0.5	µg/l	Non-detect, Best Practicable Treatment
trans-1, 2-Dichloroethene ¹	0.5	µg/l	Non-detect, Best Practicable Treatment
1,4-Dioxane	3	µg/l	DHS Action Level
Perchlorate	4	µg/l	DHS Action Level, Best Practicable Treatment
N-nitrosodimethylamine	0.002	µg/l	Non-detect, Best Practicable Treatment

¹ – EPA Method 8260B or equivalent.

Discharge limits are primarily based on the *Fourth Edition of the Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board - Central Valley Region, Sacramento River and San Joaquin River Basins*, and Best Available Technology for removal of VOCs, NDMA, and perchlorate.

Receiving Water Limitations

Receiving Water Limitations D.1 through D.13 are found in the Basin Plan and deal with general receiving water parameters. Given that this is not a discharge of elevated temperature wastewaters, limitations for temperature found in the *Water Quality Control Plan for Control of Temperatures in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California* are not included.

Chronic toxicity and acute toxicity testing of the effluent is required.

AMM (2/21/02)