

IN THE OFFICE OF THE STATE ENGINEER OF THE STATE OF NEVADA

FILED
JUL 24 1998
STATE ENGINEER'S OFFICE

IN THE MATTER OF APPLICATION NUMBER 63867
FILED BY Aerojet-General Corporation
ON February 24 1998, TO APPROPRIATE THE
WATERS OF Underground

PROTEST

Comes now U.S. Fish and Wildlife Service
Printed or typed name of protestant

whose post office address is 911 NE 11th Avenue, Portland, Oregon 97232-4181
Street No. or P.O. Box, City, State and Zip Code

whose occupation is Agency of the federal government, and protests the granting

of Application Number 63867, filed on February 24, 1998

by Aerojet-General Corporation to appropriate the
Printed or typed name of applicant

waters of Underground situated in Clark County
Underground or name of stream, lake, spring or other source

County, State of Nevada, for the following reasons and on the following grounds, to wit:

Please see Attachment A

THEREFORE the protestant requests that the application be Denied
(Denied, issued subject to prior rights, etc., as the case may be)

and that an order be entered for such relief as the State Engineer deems just and proper.

Signed *Thomas Dwyer*
Agent or protestant
Thomas Dwyer
Printed or typed name, if agent

Address 911 NE 11th Avenue
Street No. or P.O. Box No.
Portland, Oregon 97232-4181
City, State and Zip Code No.

Subscribed and sworn to before me this 17th day of July 1998

Kay Kier-Haggenjos
Notary Public

State of Oregon

County of Multnomah



➔ \$10 FILING FEE MUST ACCOMPANY PROTEST. PROTEST MUST BE FILED IN DUPLICATE.
ALL COPIES MUST CONTAIN ORIGINAL SIGNATURE.

**ADDITIONAL INFORMATION TO SUPPORT THE PROTEST
OF THE U.S. FISH AND WILDLIFE SERVICE
IN THE MATTER OF APPLICATION 63867 THROUGH 63876**

Attachment A

Nevada Water Right Application Nos. 63867 through 63876 were filed by Aerojet - General Corporation (Aerojet) on February 24, 1998 requesting a combined diversion rate of 100 cubic feet per second and a combined annual duty of 72,390 acre-feet for quasi-municipal purposes. The water is to be withdrawn from ten groundwater wells located in the Coyote Spring Valley, Groundwater Basin 210, Clark and Lincoln Counties, Nevada. The proposed points of diversion are located approximately ten to twenty miles west of the Moapa Valley National Wildlife Refuge (NWR) and twenty to thirty miles south of the Pahrnagat NWR. The total combined annual duty of all water rights sought or permitted by Aerojet in the Coyote Spring Valley is 117,185 acre-ft. The U.S. Fish and Wildlife Service (Service) requests that Application Nos. 63867 through 63876 be denied because:

- Granting of these applications may cause injury to Service water rights for water on the wildlife refuges and for other senior water right holders in the Muddy River Springs area.
 - Water may not be available to appropriate in the manner described.
 - Granting of these applications may damage habitat for species that are endangered or threatened under the Endangered Species Act or other species of concern and, therefore, may not be in the public interest.
- I. The Service manages the National Wildlife Refuge System, a network of lands administered for the purpose of conservation, protection, and restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans, as defined in the National Wildlife Refuge System Improvement Act of 1997. Included in the refuge system are the Moapa Valley NWR and the Pahrnagat NWR. Moapa Valley NWR is a 60 acre area of springs and wetlands located in the Muddy River Springs area of the Upper Moapa Valley (Groundwater Basin 218). This refuge was established in 1979 under the authority of the Endangered Species Act. The purpose of the Moapa Valley NWR is to provide protection for the endangered Moapa Dace (*Moapa coriacea*), a minnow that is endemic to the headwaters of the Muddy River system. The refuge is the most favorable area for Dace reproduction in the Muddy River ecosystem. In addition to Moapa Dace, other species of concern are found on or near the refuge, all of which depend on the water resources of the area.

Pahranagat NWR is a 5,000 acre area of spring-fed wetlands, meadows, lakes and upland desert habitat. The refuge is located at the south end of the Pahranagat Valley (Groundwater Basin 209). It was established in 1964 to provide a stopping point for waterfowl and other migratory birds and is important for a variety of waterfowl, shorebirds, songbirds, and raptors. At least two species listed under the Endangered Species Act are found on the refuge: the endangered southwest willow flycatcher (*Empidonax traillii extimis*) and the threatened bald eagle (*Haliaeetus leucocephalus*).

- II. Both refuges are located in the White River Groundwater Flow System, a regional groundwater flow system in southern Nevada which extends from southern Jakes Valley in the north to Upper Moapa Valley in the south (Eakin, 1966; Prudic et al., 1993). The flow system consists of numerous local basin fill aquifers underlain by a large regional carbonate aquifer which transmits water across topographic divides. Water from the regional carbonate aquifer flows generally south and southeast through the system and surfaces at large regional springs in the Pahranagat Valley and the Upper Moapa Valley. The terminus of the flow system is the Muddy River Springs area in the Upper Moapa Valley, where approximately 36,000 acre-ft discharge annually. Moapa Valley NWR is part of the Muddy River Springs area. Thomas et al. (1996) postulated that 28,000 acre-ft (78%) of the water emanating from Muddy River Springs was from either the Sheep Range or the White River Flow System, with the remainder coming from Lower Meadow Valley Wash. The proposed well development is in the White River Flow System, about 10 to 20 miles west and upgradient of the Moapa Valley NWR.

The Pahranagat Valley is an intermediate discharge area for the flow system. Three large springs in the valley (Hiko Spring, Crystal Spring, and Ash Spring) discharge about 25,000 acre-ft/yr from the regional carbonate aquifer (Eakin, 1966). The source of this water is the White River Flow System. A considerable amount of water underflows the valley through the carbonate aquifer to flow either south through the Coyote Spring Valley to the Muddy River Springs area or west to the Ash Meadows area. The estimates of flow from the Pahranagat Valley to the Muddy River Springs area vary from 14,000 acre-ft/yr to 19,000 acre-ft/yr (Kirk and Campana, 1990; Thomas et al., 1996). The flow from Pahranagat Valley to Ash Meadows is estimated to be 4,000 to 7,000 acre-ft/yr (Kirk and Campana, 1990; Thomas et al., 1996; Burby, 1997). The proposed well development is about 20 to 30 miles south and downgradient of the Pahranagat NWR.

The Coyote Spring Valley physically and hydrologically connects the Pahranagat Valley to the north, the Sheep Range to the west, and the Muddy River Springs area to the east (Eakin, 1966; Schmidt and Dixon, 1995; Thomas et al., 1996). Regional flow reaching the Muddy River Springs area from the Sheep Range or the Pahranagat Valley passes through the Coyote Spring Valley, the site of the proposed well development. Capture of any or all of the outflow from the Coyote Spring Valley may decrease spring discharge in the Muddy River Springs and may also affect spring discharge and water levels elsewhere

in the flow system and will be detrimental to existing water rights in the area.

- III. The Service has secured water rights to protect the water resources of both refuges. On the Moapa Valley NWR, the Service owns one water right for 3.6 cfs of spring discharge, the average collective spring discharge from 16 springs and seeps on the refuge. The water right is for non-consumptive use and there is no annual duty defined on the permit. The source of the springs is the regional carbonate aquifer, as evidenced by the warm temperature, the water chemistry, and the constant flow rates (Eakin, 1966). In addition to this water right, all water emanating from springs and seeps on the refuge makes its way into the Muddy River and is appropriated by downstream users. Therefore, any effect to spring discharge would impact downstream water rights in the Muddy River as well as water rights on the refuge.

On the Pahrangat NWR, the Service has certificated water rights for 5,044 acre-ft of surface water and 1,686 acre-ft of groundwater. About 4,250 acre-ft of the surface water rights are from two of the three regional springs in the valley, Ash Spring and Crystal Spring. In addition, the Service has three pending applications for small springs on the refuge and two pending applications for additional flow from Ash Spring and Crystal Spring. The annual duty is undefined on all of the pending applications.

- IV. Aerojet has applied for water rights in the Coyote Spring Valley on three separate occasions. Permit numbers 49414, 49660-62, and 49978-84, filed in 1985 and 1986, are for a combined annual duty of 8,600 acre-ft. Application numbers 63272-76, filed in 1997, are for a combined annual duty of 36,195 acre-ft. Application numbers 63867-76, filed in 1998 and the subject of this protest, are for a combined annual duty of 72,390 acre-ft. All the applications are non-supplemental. The total combined annual duty is 117,185 acre-ft.

The State Engineer, in Ruling 4542, concluded that there was at least 18,000 acre-ft of additional water available in the carbonate aquifer in the Coyote Spring Valley. The Ruling further discusses the possibility that the quantity of carbonate water underflow from the Coyote Spring Valley to the Muddy River Springs, historically estimated at 37,000 acre-ft, may be in the range of 51,000 to 63,000 acre-ft, although the fraction of this amount actually available for appropriation was not stipulated. In its applications, Aerojet has specifically stated that it is seeking all unappropriated water from the carbonate aquifer as defined in Ruling 4542. Considering the estimates of available water, the total volume of water sought by Aerojet in the Coyote Spring Valley (117,185 acre-ft) is extraordinary and far exceeds even the highest estimates of available water in the Coyote Spring Valley. In the same ruling, the State Engineer granted a water right permit for 5,000 acre-ft of groundwater in the Coyote Spring Valley to the Nevada Power Company with a 1983 priority date. This is senior to all of the Aerojet water right applications in the Coyote Spring Valley and would not be available to Aerojet.

- V. The impact of the proposed withdrawals was examined using the U.S. Geological Survey's regional groundwater model developed for the Great Basin (Prudic et al., 1993; Schaefer and Harrill, 1995). Pumping was simulated from the carbonate aquifer. In the model, the spring discharge at Moapa Valley NWR is included as part of the discharge from the Muddy River Springs area. The large scale of the model and the lack of hydrogeologic information for the Great Basin limit the accuracy of the model output with regard to individual basins and individual spring groups. The model can be used to determine in an approximate sense whether or not a proposed diversion will impact water levels and spring discharge within a hydrographic basin but the magnitude and timing of those impacts as indicated by the model are less certain (Jim Harrill, personal comm., 1997). Nevertheless, the model represents a valuable tool for a first approximation of probable impacts from pumping.

Model simulations suggest that there would be an immediate and substantial impact on spring discharge from the proposed withdrawals. The effect is especially pronounced at Muddy River Springs and is proportional to the pumping rate. A withdrawal of 8,600 acre-ft/yr (the amount applied for in the Aerojet applications from 1985-86) results in a 10% decrease in spring discharge at the Muddy River Springs after 10 years and a 16% decrease at steady state. A withdrawal of 44,800 acre-ft/yr (the total amount applied for in the Aerojet applications from 1985-86 and 1997) results in a 38% decrease in spring discharge at the Muddy River Springs after 5 years, a 51% decrease after 10 years, and a 82% decrease when the system reaches steady state. Decreases are observed in the regional spring discharge in Pahranaagat Valley and Ash Meadows too at this pumping rate. A withdrawal of 117,185 acre-ft/yr (the total combined duty for all Aerojet applications) results in a no spring discharge at the Muddy River Springs after 5 years and significant declines in the regional spring discharge at Pahranaagat Valley and Ash Meadows once the system reaches steady state.

The results from the regional groundwater model suggest that even the current level of pumping already permitted Aerojet (the 8,600 acre-ft/yr allowed in the 1985-86 applications) will substantially affect the spring discharge at the Muddy River Springs area and therefore the Moapa Valley NWR. Withdrawals above and beyond this amount have dire and unacceptable consequences for the spring discharge in the Muddy River Springs area. Spring discharge and water levels in Pahranaagat Valley and Ash Meadows would be seriously affected at the proposed withdrawal rates as well. Impacts to any of these areas would impair Service-owned, as well as other senior water rights. The model results support the Service's contention that there is no additional water available beyond what is currently appropriated in the Coyote Spring Valley. The Service strongly believes that these applications should be denied.

- VI. One federally listed endangered fish species, the Moapa Dace (*Moapa coriacea*), and numerous species of concern to the Service are present in the Muddy River Ecosystem including the Virgin River chub (*Gila seminuda*), the Moapa speckled dace (*Rhinichthys*

osculus moapae), the Moapa White River springfish (*Crenichthys baileyi moapae*), the Moapa pebblesnail (*Pyrgulopsis avernalis*), the Grated tryonia (*Tryonia clathrata*), the Moapa Warm Spring riffle beetle (*Stenelmis moapa*), the Amargosa naucorid (*Pelocoris shoshone shoshone*), and the Moapa water strider (*Rhagovelia becki*). All of these species are linked to the water resources of the ecosystem. Reducing spring discharge or flow in the Muddy River could adversely impact these species and would be detrimental to the public interest.

Three federally listed endangered fish species are present in the Pahranaagat Valley: the Pahranaagat roundtail chub (*Gila robusta jordani*), the Hiko White River springfish (*Crenichthys baileyi grandis*), and the White River springfish (*Crenichthys baileyi grandis*). Pahranaagat roundtail chub occur only in 2.2 miles of Pahranaagat Creek and in 1.6 miles of the main irrigation ditch in the Valley. White River springfish are restricted to Ash Spring, and fewer than 125 Hiko White River springfish are found only in Crystal Spring. Reducing spring discharge or water levels in the Pahranaagat Valley could adversely impact these species and would be detrimental to the public interest.

- VII. The White River Groundwater Flow System has seen an unprecedented number of water development proposals in the last year. Since July 1997, there have been new water right applications to appropriate at least 160,000 acre-feet of groundwater annually in this flow system. The cumulative effect from these applications would almost certainly be devastating to existing water rights and water resources in the flow system. The Service is concerned that this scale of groundwater appropriation in this system would be unsustainable, irresponsible, and detrimental to the public interest.

Aerojet's applications in the Coyote Spring Valley represent a major fraction of the new water right proposals in the flow system. Based on our analysis, there is no water available for appropriation in the Coyote Spring Valley and there is no level of additional appropriation that is acceptable. The Service believes that additional appropriation would injure us and other senior water right holders and be detrimental to the public interest. We request that these applications be denied.

Literature Cited

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Prudic, D. E., Harrill, J. R., and Burby, T. J., 1993. Conceptual evaluation of regional ground-water flow in the carbonate-rock province of the Great Basin, Nevada, Utah, and adjacent states. U.S. Geological Survey Open-File Report 93-170.

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