Large-scale ground-water withdrawals in the valleys likely would affect the discharge of the springs on the southeast and west sides of the southern Snake Range, and streamflow along Big Springs Creek and Lake Creek. These areas, although not studied in detail, probably represent areas that drain ground water as described by Theis (1940). Thus, the spring-discharge areas, Big Springs Creek, Lake Creek, and Pruess Lake were included as areas where surface-water resources likely are susceptible to ground-water withdrawals in Snake and Spring Valleys (pl. 1). Big Springs and the numerous springs at the base of the alluvial slopes on the west side of the southern Snake Range could be affected by ground-water withdrawals similar to springs in Pahrump and Las Vegas Valleys. Large-scale ground-water withdrawals from aquifers in the valleys lowered hydraulic heads and caused springs to stop flowing (Malmberg, 1965, p. 59; Harrill, 1976, p. 43; Harrill, 1986, p. 22).

Summary

Discharge data were continually collected at eight streams and one spring during 2003 and 2004 to quantify discharge and assess the spatial and temporal variability of flow of streams and springs within the Great Basin National Park area. Streamflow gages were installed near the park boundary on Strawberry Creek, Shingle Creek, Lehman Creek, Baker Creek, Snake Creek, South Fork Big Wash, Williams Canyon, Decathon Canyon, and Rowland Spring. Three additional gages were installed along Snake Creek to help characterize streamflow gains and losses within the upper and lower reaches of the drainage. Three of the sites, Snake Creek at the park boundary, South Fork Big Wash, and Decathon Canyon, were intermittent. All other sites were perennial. Mean annual discharge for the perennial streams ranged from 0.53 ft^3/s at South Fork Big Wash to 9.08 ft^3/s at Baker Creek. Seasonal variability of streamflow was climate driven and generally uniform as the minimum and maximum mean monthly discharges occurred in February and June, respectively, at all perennial sites except Strawberry Creek. Decathon Canyon had the lowest annual stream discharge as flow only occurred on 1 day in each of the 2 years of data collection. Maximum mean monthly discharge at Snake Creek at the park boundary and South Fork Big Wash also occurred in June during spring runoff.

Synoptic-discharge and water-property measurements were collected during the spring, summer, and autumn of 2003 along selected reaches on Strawberry, Shingle, Lehman, Baker, and Snake Creeks and Big Wash. Profiles of the selected reaches were developed to relate stream characteristics to geology, and show areas where streams are effluent and likely or potentially susceptible to ground-water withdrawals in adjacent valleys. Streams in contact with permeable rocks or sediments, and areas where streams receive either spring discharge or ground-water inflow comprise areas where streams are most susceptible.

The areas where surface-water resources likely are susceptible to ground-water withdrawals in adjacent valleys that were part of this study include (1) the lower half of Strawberry Creek downstream of the fault contact of the intrusive rocks and Tertiary rocks, including the springs and seeps; (2) Shingle Creek downstream of the intrusive rocks and upstream of the pipeline; (3) Lehman Creek from the lower Lehman Creek campground to the terminus of the stream in Snake Valley, including Rowland Spring and Cave Springs; (4) Baker Creek upstream of the confluence with Pole Canyon tributary to the terminus of the stream in Snake Valley; (5) Snake Creek from just upstream of the park boundary to the terminus of the stream, including Spring Creek.

Areas within the park where surface-water resources potentially are susceptible to ground-water withdrawals include that part of Snake Creek that crosses over the younger undifferentiated rocks (D€r) and its tributaries on the upper plate of the SSRD, and the upper part of Snake Creek that crosses over undifferentiated sedimentary rocks (€r) on the lower plate of the SSRD.

Surface-water resources in other areas adjacent to the park that likely are susceptible to ground-water withdrawals in Spring and Snake Valleys are (1) Williams Canyon upstream of the pipeline, and the following areas that were not gaged, (2) Weaver Creek along the alluvial slope on the northeast end of the southern Snake Range, (3) Pine and Ridge Creeks on the west side of the southern Snake Range between the mountain front and where streams are diverted into pipelines, (4) the numerous springs at the change in slope between the valley floor of Spring Valley and the alluvial slope on the west side of the southern Snake Range, and (5) Big Springs, Big Springs Creek, Lake Creek, Big Wash near Hidden Canyon Ranch, and Pruess Lake in southern Snake Valley.

Areas within the park where surface-water resources probably are not susceptible to ground-water withdrawals in adjacent Spring and Snake Valleys include Big Wash, Lexington Creek, Decathon Canyon, Big Spring Wash, and Lincoln Canyon. Johns Wash and Murphy Wash, adjacent to the park, also would not be susceptible to ground-water withdrawals.

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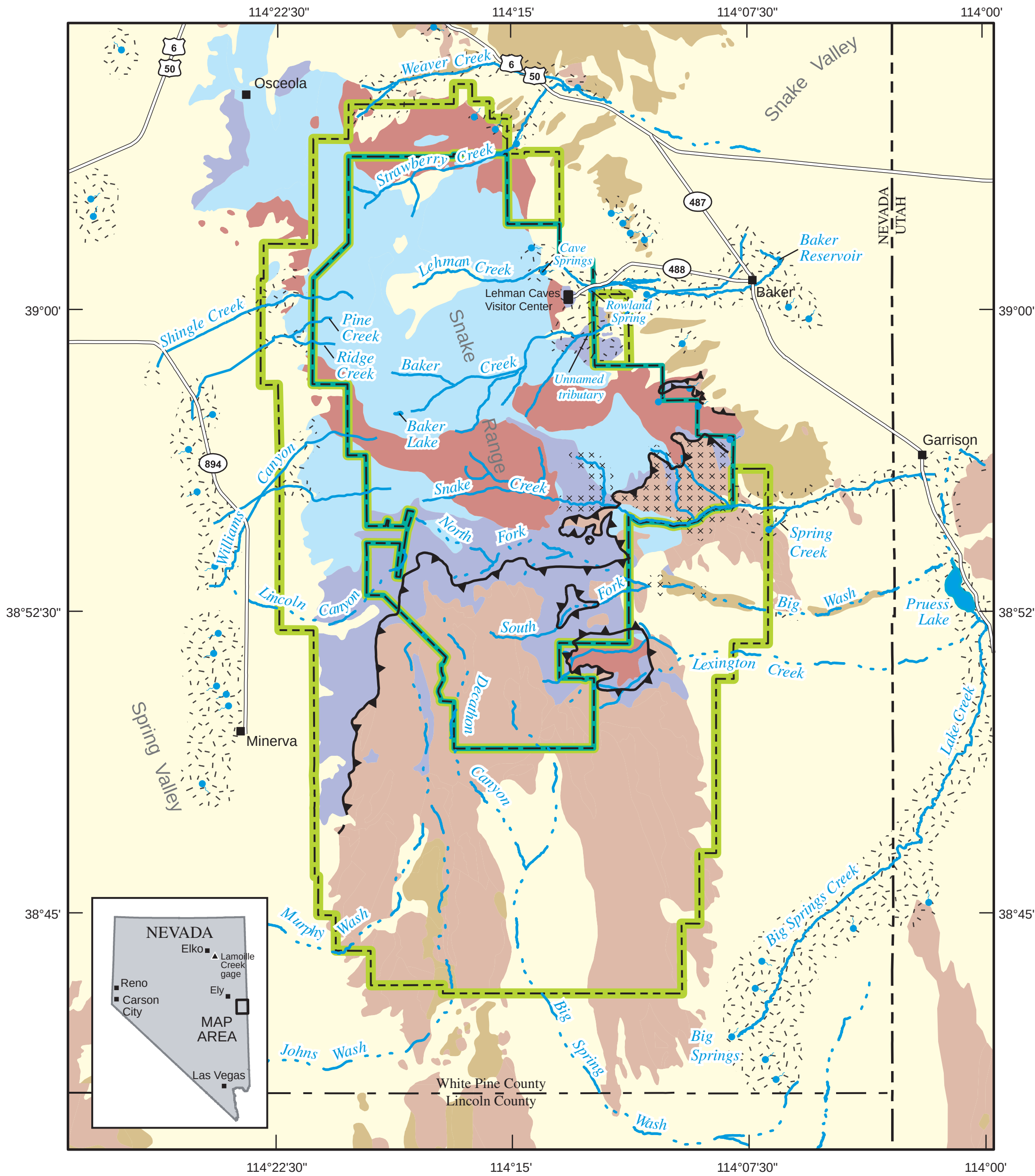
SCIENTIFIC INVESTIGATIONS REPORT 2006–5099
Plate 1
Elliott, P.E., Beck, D.A., and Prudic, D.E., 2006
Characterization of Surface-Water Resources in the Great Basin
National Park Area and Their Susceptibility to Ground-Water
Withdrawals in Adjacent Valleys, White Pine County, Nevada



Base from U.S. Geological Survey digital data, 1:100,000, 1979–1988. Universal Transverse Mercator projection, North American Datum of 1983, Zone 11

5 0 5 MILES
5 0 5 KILOMETERS

Geology modified from Hose and Blake (1976)

EXPLANATION

- **Area where surface-water resources likely are susceptible to ground-water withdrawals**
- **Area where surface-water resources potentially are susceptible to ground-water withdrawals**

Geology

- QTs Alluvial and glacial deposits
- Tr Tertiary rocks
- TJi Intrusive rocks
- D€r Younger undifferentiated rocks
- €r Undifferentiated sedimentary rocks
- €Zr Older undifferentiated rocks

- **Southern Snake Range décollement**
- **Humboldt National Forest boundary**
- **Great Basin National Park boundary**
- **Spring**

GENERALIZED AREAS WHERE SURFACE-WATER RESOURCES LIKELY OR POTENTIALLY ARE SUSCEPTIBLE TO GROUND-WATER WITHDRAWALS IN ADJACENT VALLEYS, GREAT BASIN NATIONAL PARK AREA, NEVADA

By
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