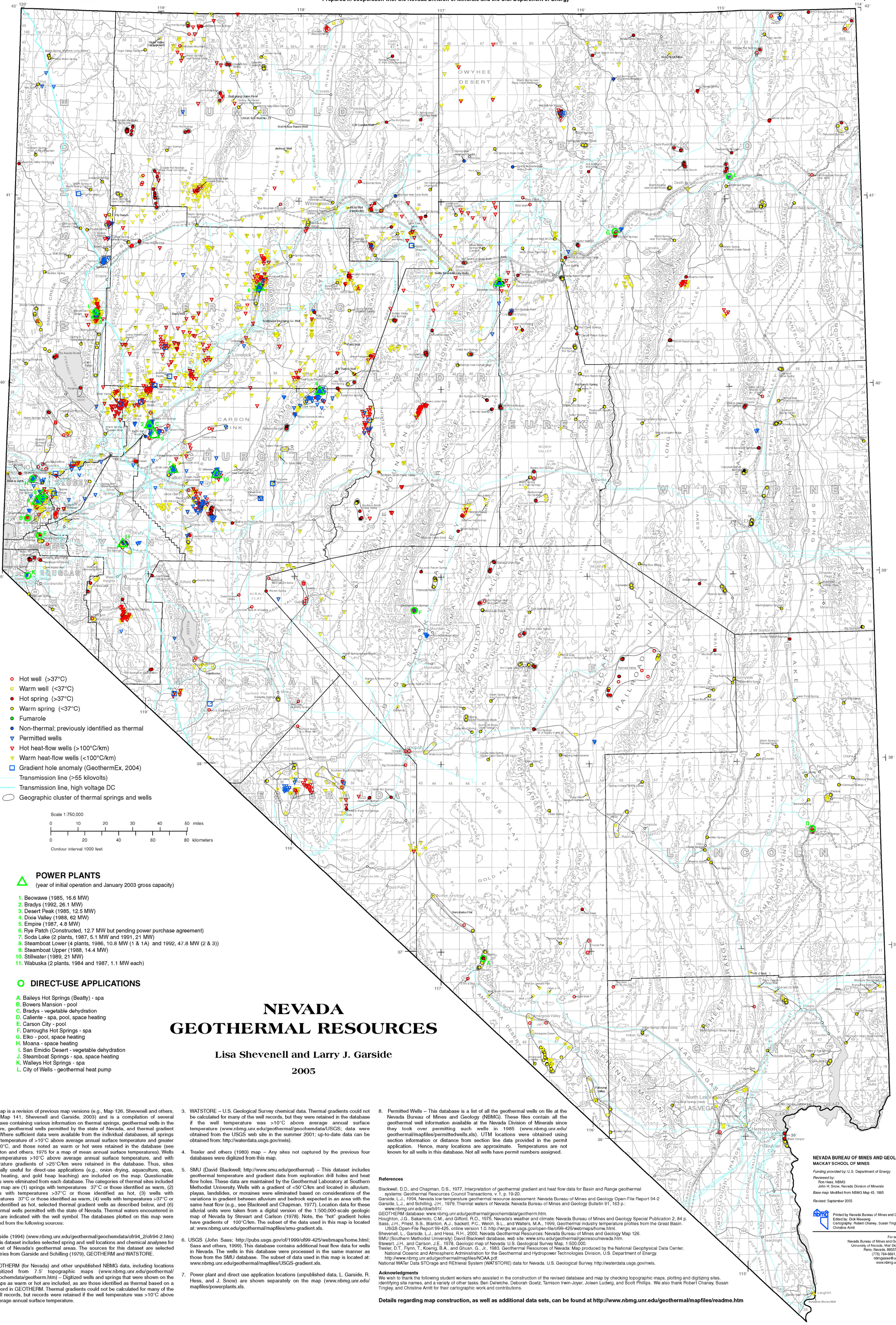

POWER PLANTS

(year of initial operation and January 2003 gross capacity)

1. Beowawe (1985, 16.6 MW)
2. Bradys (1992, 26.1 MW)
3. Desert Peak (1985, 12.5 MW)
4. Dixie Valley (1988, 62 MW)
5. Empire (1987, 4.8 MW)
6. Rye Patch (Constructed, 12.7 MW but pending power purchase agreement)
7. Soda Lake (2 plants, 1987, 5.1 MW and 1991, 21 MW)
8. Steamboat Lower (4 plants, 1986, 10.8 MW (1 & 1A) and 1992, 47.8 MW (2 & 3))
9. Steamboat Upper (1988, 14.4 MW)
10. Stillwater (1989, 21 MW)
11. Wabuska (2 plants, 1984 and 1987, 1.1 MW each)

DIRECT-USE APPLICATIONS

A. Baileys Hot Springs (Beatty) - spa
B. Bowers Mansion - pool
C. Bradys - vegetable dehydration
D. Caliente - spa, pool, space heating
E. Carson City - pool
F. Darroughs Hot Springs - spa
G. Elko - pool, space heating
H. Moana - space heating
I. San Emidio Desert - vegetable dehydration
J. Steamboat Springs - spa, space heating
K. Walleys Hot Springs - spa
L. City of Wells - geothermal heat pump

NEVADA GEOTHERMAL RESOURCES

Lisa Shevenell and Larry J. Garside

2005

This map is a revision of previous map versions (e.g., Map 126, Shevenell and others, 2000; Map 141, Shevenell and Garside, 2003) and is a compilation of several databases containing various information on thermal springs, geothermal wells in the literature, geothermal wells permitted by the state of Nevada, and thermal gradient wells. Where sufficient data were available from the individual databases, all springs with a temperature of >10°C above average annual surface temperature and greater than 20°C, and those noted as warm or hot were retained in the database (see Houghton and others, 1975 for a map of mean annual surface temperatures). Wells with temperatures >10°C above average annual surface temperature, and with temperature gradients of >25°C/km were retained in the database. Thus, sites potentially useful for direct-use applications (e.g., onion drying, aquaculture, spas, space heating, and gold heap leaching) are included on the map. Questionable records were eliminated from each database. The categories of thermal sites included on the map are (1) springs with temperatures 37°C or those identified as warm, (2) springs with temperatures >37°C or those identified as hot, (3) wells with temperatures 37°C or those identified as warm, (4) wells with temperatures >37°C or those identified as hot, selected thermal gradient wells as described below, and (6) geothermal wells permitted with the state of Nevada. Thermal waters encountered in mines are indicated with the well symbol. The databases plotted on this map were obtained from the following sources:

1. Garside (1994) (www.nbmg.unr.edu/geothermal/geochemdata/ofr94_2/ofr94-2.htm) This dataset includes selected spring and well locations and chemical analyses for most of Nevada's geothermal areas. The sources for this dataset are selected entries from Garside and Schilling (1979), GEOTHERM and WATSTORE.

2. GEOTHERM (for Nevada) and other unpublished NBMG data, including locations digitized from 7.5' topographic maps (www.nbmg.unr.edu/geothermal/geochemdata/geotherm.htm) – Digitized wells and springs that were shown on the maps as warm or hot are included, as are those identified as thermal based on a record in GEOTHERM. Thermal gradients could not be calculated for many of the well records, but records were retained if the well temperature was >10°C above average annual surface temperature.

3. WATSTORE – U.S. Geological Survey chemical data. Thermal gradients could not be calculated for many of the well records, but they were retained in the database if the well temperature was >10°C above average annual surface temperature (www.nbmg.unr.edu/geothermal/geochemdata/USGS; data were obtained from the USGS web site in the summer 2001; up-to-date data can be obtained from: http://waterdata.usgs.gov/nwis).

4. Trexler and others (1983) map – Any sites not captured by the previous four databases were digitized from this map.

5. SMU (David Blackwell; http://www.smu.edu/geothermal) – This dataset includes geothermal temperature and gradient data from exploration drill holes and heat flow holes. These data are maintained by the Geothermal Laboratory at Southern Methodist University. Wells with a gradient of <50°C/km and located in alluvium, playas, landslides, or moraines were eliminated based on considerations of the variations in gradient between alluvium and bedrock expected in an area with the same heat flow (e.g., see Blackwell and Chapman, 1977). Location data for these alluvial units were taken from a digital version of the 1:500,000-scale geologic map of Nevada by Stewart and Carlson (1978). Note, the "hot" gradient holes have gradients of 100°C/km. The subset of the data used in this map is located at: www.nbmg.unr.edu/geothermal/mapfiles/smu-gradient.xls.

6. USGS (John Sass; http://pubs.usgs.gov/of/1999/of99-425/webmaps/home.html; Sass and others, 1999). This database contains additional heat flow data for wells in Nevada. The wells in this database were processed in the same manner as those from the SMU database. The subset of data used in this map is located at: www.nbmg.unr.edu/geothermal/mapfiles/USGS-gradient.xls.

7. Power plant and direct use application locations (unpublished data, L. Garside, R. Hess, and J. Snow) are shown separately on the map (www.nbmg.unr.edu/mapfiles/powerplants.xls).

8. Permitted Wells – This database is a list of all the geothermal wells on file at the Nevada Bureau of Mines and Geology (NBMG). These files contain all the geothermal well information available at the Nevada Division of Minerals since they took over permitting such wells in 1985 (www.nbmg.unr.edu/geothermal/mapfiles/permittedwells.xls). UTM locations were obtained using section information or distance from section line data provided in the permit application. Hence, many locations are approximate. Temperatures are not known for all wells in this database. Not all wells have permit numbers assigned.

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National WATer Data STOrage and REtrieval System (WATSTORE) data for Nevada. U.S. Geological Survey. http://waterdata.usgs.gov/nwis.

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Details regarding map construction, as well as additional data sets, can be found at http://www.nbmg.unr.edu/geothermal/mapfiles/readme.htm

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