

MEMORANDUM

May 4, 2012
File No. 12-2-033

TO: Board of Directors
Dave Hicks, Interim General Manager
Blue Lake Springs Mutual Water Company

FROM: Tom Elson
Luhdorff & Scalmanini

SUBJECT: GROUNDWATER STUDY AND WATER SUPPLY OPTIONS

Introduction

Luhdorff and Scalmanini Consulting Engineers (LSCE) is authorized by Blue Lake Spring Mutual Water Company (BLS) to conduct a study of groundwater supply options and to quantify the need and appropriate actions to develop back-up source capacity for the White Pines Lake water supply wells. This memorandum discusses considerations and criteria that will be employed in the study and the manner and context in which various water supply options should be considered by the Board and shareholders.

Adequacy of Existing Water Supply

There are two key metrics for adequacy of a public water system: the source must provide sufficient quantity in various water year types and water quality must meet drinking water standards under California Department of Public Health (CDPH) regulations. For systems that rely solely on groundwater wells, CDPH regulations also require that the system have the ability to meet maximum day demand with the highest capacity well out of service.

For about 10 years prior to 2011, the BLS water supply consisted of groundwater pumped from two wells at White Pines Lake and surface water from an intertie with Calaveras County Water District (CCWD). In 2011, use of CCWD water was discontinued and at present the BLS water supply is provided through the combined flow from the two White Pines Lake wells. A third well at White Pines Lake is permitted for use by CDPH, but is not equipped with a pump. There are two potential concerns with the wells at White Pines Lake: a) it is unknown whether the wells can provide sufficient capacity in dry years and b) there is no back-up source if the highest capacity well is out of service.

LSCE's scope of work includes quantifying the extent to which the White Pines Lake wells can meet source capacity requirements in all water year types. From that determination, a basis for developing a backup source would be either of the following:

1. If groundwater source capacity is sufficient in all water year types, back-up service could be provided by simply rehabilitating and installing a pump in the idle third well, or by drilling and equipping another well at the site.
2. If source capacity is insufficient, then a new back-up well must provide emergency service in the event the highest capacity active well is out of service, plus it must make up the shortfall in supply in dry years.

Under the second condition above, the backup well would need to be located some distance from the existing well field in order to avoid mutual pumping interference¹.

Based on the status of the existing system, LSCE recommended and scoped a study to quantify the capability of existing wells to meet system needs and to guide planning and design of a back-up source. The following sections discuss some basic considerations that are relevant to the BLS system.

Groundwater as a Source of Supply

Since BLS currently relies on groundwater as its primary source of supply, Board actions with respect to water supply options should be informed by an understanding of certain aspects of groundwater and wells:

Groundwater Occurrence

Groundwater in the Arnold area, like many settings in California, is a renewable resource. That is, groundwater percolates into the ground from precipitation and runoff (called recharge) and moves through the subsurface from high elevation to low as a function of aquifer characteristics. Groundwater levels, as measured in wells, are highest in wet months when recharge is high and lowest in the dry summer months. When groundwater is extracted (i.e., pumped) for water supply, a balance between recharge and extraction must exist for the resource to be considered sustainable. A cursory review of data on the White Pines Lake wells suggests that there is likely a balance between pumping and recharge over the period since the mid 1980s when the wells were drilled and commissioned.

As in many settings, a balance between extraction and recharge may not be achieved in every water year type and many systems exhibit declines in water levels (that in turn may constrain water supply in some years) over a series of dry years, but then recover in normal to wet years. This relationship with climatic patterns dictates that water systems be designed to accommodate dry year conditions. Where options are limited, water entities may implement water conservation, reduce reliance on groundwater by using reclaimed water for non-potable demand, or other measures designed to mitigate dry year supply shortfalls.

¹ Mutual pumping interference is the water level drawdown that running wells induce on each other. Interference potentially constrains the pumping rate by reducing the available pumping drawdown in each well.

Another measure to address dry year shortages is conjunctive use of groundwater and surface water. An example of conjunctive use is when a water entity uses available surface water to reduce reliance on groundwater in wet to normal years, permitting the groundwater basin to recover. Then, in dry years when surface water is scarcer, the water entity would pump a greater fraction of groundwater that accesses the accumulated, or stored, groundwater. Another example is when a water entity develops a surface water source to use in conjunction with groundwater to reduce vulnerability that arises from reliance on a single source. While these examples are not directly applicable to the BLS system, the principles are relevant to current issues being considered, as discussed below.

Use of Wells in Public Water Systems

The BLS water system is sufficiently large to be regulated as a public water system under the state Department of Public Health. Wells used as supply sources in a public water system must meet siting and construction criteria. The three existing White Pines Lake wells (two active and one idle) are permitted for use in the BLS system and therefore comply with CDPH regulations. New wells, however, face requirements and standards that are more stringent than employed in permitting the existing White Pines Lake wells. The basic requirements for siting and constructing a new well are delineated in Title 22 of the California Code of Regulations. In addition, each CDPH district office may specify other requirements for a particular setting and set of operating conditions. Some of the requirements that are relevant to assessing candidate well sites include:

1. The proposed well project must undergo a CEQA analysis.
2. The new site must undergo an evaluation under the state Drinking Water Source Assessment and Protection (DWSAP) Program.
3. The water entity must maintain a 50-foot control zone radius protecting the source from vandalism, tampering, or other threats.
4. The well location must meet offset requirements from sanitary hazards such as septic, sewer, and stormwater systems.
5. The well must be constructed according to California Department of Water Resources Bulletins 74-81 and 74-90.
6. The well station must have provisions to allow the well to be pumped to waste with a waste discharge line that is protected against backflow.

The general process of adding a new well to a water system requires that an application to amend the water system permit be submitted for review and approval by CDPH prior to constructing the well. In the case of an existing well, construction records, water tests, and CEQA and DWSAP documents must be submitted for review. CDPH action regarding an existing well is discretionary, meaning that it is advisable that a water entity obtain prior concurrence from the agency before executing purchase or lease agreements when seeking to add an existing well to a system.

With regard to CEQA, many well projects are implemented under a mitigated negative declaration that typically addresses construction and operational issues (e.g., noise and traffic). Depending on the site, additional concerns may need to be evaluated including impacts of pumping on other users, water rights, impacts on existing wetlands or springs, and sustainability of the resource. These issues may greatly expand the scope of a CEQA analysis.

BLS Water Supply Options

Considering the current reliance on groundwater, and noting that there may be a need to develop an additional well source for dry year supply and/or as a back-up, there are limited, but potentially viable, options to address short- and long-term needs. Due to the process of adding new sources (i.e., it takes time and planning to add a new well to a permit under CDPH regulations), and given the study now underway by LSCE, it would be prudent for BLS to evaluate all viable options concurrently so as to judge their technical and economic merits in a timely manner. The most viable options consist of 1) assess and optimize use of the existing White Pines Lake wells (now being done through LSCE), 2) evaluate potential new well sites, and 3) determine feasibility of alternative surface water supply (i.e., CCWD water). These options are discussed below:

Existing White Pines Lake Wells

The study being conducted by LSCE seeks to quantify the maximum available source capacity from the White Pines Lake site. With that information, BLS can seek improvements to optimize use of the site. Optimizing source capacity at the site has several advantages:

1. The existing wells are permitted through CDPH and require no discretionary action for their continued or expanded use, such as installing a pump in the idle well.
2. The site is already integrated into the distribution system (i.e., doesn't need additional distribution piping or utility hook-ups).
3. Power is provided through CCWD and is less costly than other sites that would require PG&E service.
4. There is a degree of certainty in the long-term yield of the source to the extent that pumping to date (as reflected by historic water levels) has not depleted the groundwater resource at this location.

Potential limitations of the White Pines Lake site include age of the wells (one of the wells had a partial cave-in in 2011), mutual pumping interference (to be defined in LSCE's study), and ability to provide sufficient supply during dry year conditions (also to be defined in LSCE's study).

New Well Sites

Concurrent with evaluation of the White Pines Lake wells, BLS may anticipate the potential need to develop a new well at a site other than at White Pines Lake. While the design flow



rate for an off-site well will be defined in the LSCE study, candidate sites can be evaluated and ranked according to costs and risks associated with each location. Some general ranking criteria for new sites include:

- Site is compatible for use as a water supply source in a public water system (examples of compatible sites are open spaces at schools or parks);
- Site can satisfy control zone and minimum offsets from contamination sources;
- Site can satisfy CEQA and DWSAP requirements;
- Feasible and reasonable cost to connect to power utility;
- Reasonable cost to connect to the BLS mainline;
- A purchase option can be obtained that allows feasibility testing (e.g., test hole drilling).

As indicated above, evaluation and ranking of a new site should consider provisions for conducting tests including water quality and yield. Purchase options that permit testing as a precondition is a key requirement. Alternatively, lease agreements would be ranked less favorably than purchase options for public water systems because of limits of control by the water entity. Lease agreements are rarely used for public systems because of the long-term needs of the water entity and the investment associated with developing and connecting a new source of supply.

For sites that satisfy all or most of the above criteria, and prior to executing right of entry agreements and conducting tests or drilling test holes, it is recommended that information be submitted or discussed with CDPH for concurrence/approval given its discretionary power to approve a new source for the water system.

Surface Water Source

An alternative water supply source for the BLS water system is CCWD water. BLS is currently conducting an annexation feasibility study that will provide a basis to judge the surface water option relative to continued reliance on groundwater wells (with associated improvements such as adding a back-up well). Considering that many entities have no surface water alternative, the annexation study represents a potentially important basis for judging risks and upgrades to groundwater facilities and continued future reliance on wells.