

# Water protection a priority for Lyons, Kansas

**T**he first week of December 2005 was a high water mark in drinking water protection for the citizens of Lyons, Kan. Lyons City Council members approved a community Source Water Protection Plan on December 5 and the next day on December 6 a ribbon cutting ceremony marked the final phase completion of a combination salt waste (chloride) and volatile organic compound (VOC) containment project that took city water wells out of harms way.

The mining of salt deposits left by the great inland sea of millennia past has been part of the work heritage of Lyons for well over a hundred years. One of the mines producing from the late 1800s and closing in 1948, the Old North Lyons Mine, became a problem when it started leaching salt waste into groundwater in the mine area. That contamination then migrated south through Lyons, and ultimately mixed with chloride contamination associated with the American Salt mine site south of town. The chloride plume was also putting the water quality of Lyons' public water wells 2, 3, and 4 in jeopardy. No one remained that could be responsible for the Old North Lyons Mine. It became an orphan assigned to the State Water Plan (SWP) program in 1992. Through the SWP, the old mine shaft was plugged two years later.

Concerns about the impending well contamination prompted evaluation and corrective action. In 1998 a "take-no-prisoners" community/business/government partnership saw members tackle the project and keep the moving plume from intercepting the city wells.

The Kansas Dept. of Health and Education (KDHE) and the North American Salt Co. (NAMSCO) that took over the operation of the American Salt facility and its remediation project and with assistance from Lyons department

contain the Old North Mine plume. Removed water contaminated with chloride continues to be conveyed to the NAMSCO facility where it is pumped into a deep injection well for disposal. NAMSCO, in an overriding community interest to

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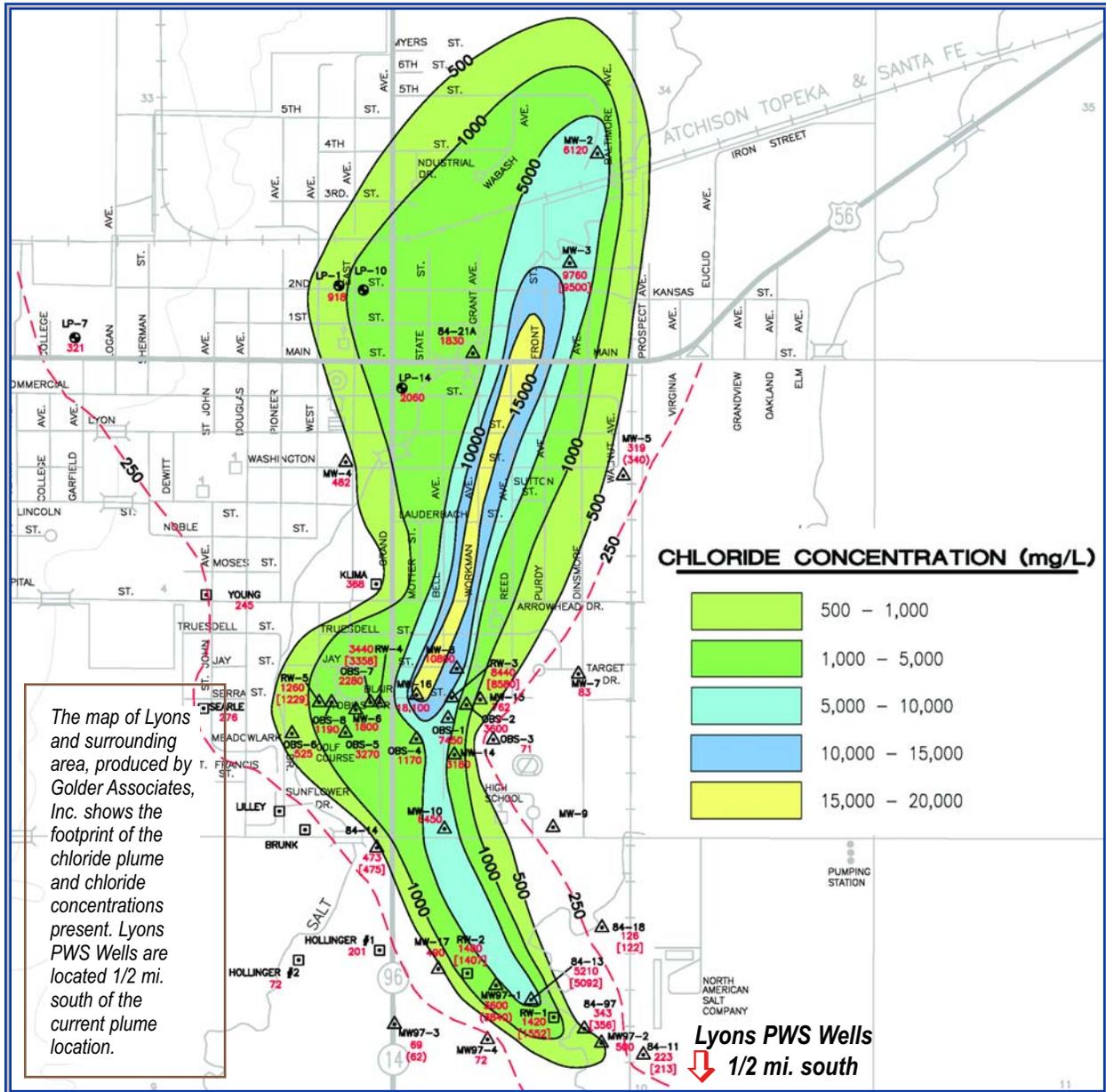
personnel, initiated what would be called the Lyons Southern Containment Project. Two ground water withdrawal wells were drilled west of the American Salt site to

protect the city water wells, voluntarily accommodates the water disposal.

Several types of VOCs were identified along with the chloride



*A December 6, 2005 ribbon cutting ceremony was conducted in front of one of the project remediation wells at the Lyons Town and Country Club. Ribbon cutters included left to right: Lyons Utilities Superintendent David Kendrick, NAMSCO Vice President of Manufacturing Larry Schulte, APAC Shears-Kansas, Inc. Representative Jeff Shaw, KDHE Voluntary Cleanup Unit Chief Frank Arnwine, Lyons Mayor Clarence Moses and Golder Associates Manager Randy March. Immediately following the ribbon cutting ceremony an open house was held at Lyons City Hall.*



during continuous chloride plume monitoring at the removal wells. Further KDHE investigations confirmed that the VOC plume was moving south and that it overlapped the chloride plume. All were effectively controlled by the two southern containment wells.

In December 2002 a KDHE General Information Summary Report first addressed the technical and economic benefits and risks of developing a project phase 2, to be called the Lyons Northern Containment Project. The reasons to

do this are summarized by Frank Arnwine, KDHE geologist and Unit Chief, Voluntary Cleanup Unit who worked on both projects.

“The nature of the aquifer and chloride plume configuration north of the current containment location make us think that lower volumes of ground water withdrawal could be used for containing the plume and higher concentrations or greater mass of chloride removed, providing more bang for the buck,” he said. “Costs associated with continuous operation of the

Southern Project recovery wells are significant and include several thousand dollars annually just for electricity, pump replacement and maintenance. A smaller system would require less electrical cost and likely less operation and maintenance. Over the life of the project, significant cost savings could be expected.”

Pertinent data collection on the Northern Containment Project was begun immediately using test wells, pump test and analyzing data from aquifer flow models in order to

conceptualize a design of the Northern Containment System.

The testing indicated that a substantial dollar savings and additional benefits could be had by heading off the chloride plume further upstream before it would contaminate larger volumes of water downstream as it spread. The northern wells would only need to pump a maximum of 30 gpm while the southern wells currently pump 200 gpm. With that lower pumping rate, much less ground water would be depleted from the aquifer. The VOC ground water contamination would still be contained with the upstream removal. NAMSCO will also see a significant benefit from the project. When the southern wells are shut down, in an estimated six to 10 years after the Northern Project commences, NAMSCO will then be able to have more flexibility in handling their water balance issues. That will ensure an ability to continue addressing the chloride plume water and not jeopardize the order

to comply with their own discharge permitting issues. The long-term ability for the plume to be contained has been enhanced by the completion of the Northern Containment Project.

The final agreement between parties was signed on February 16, 2005 and the final design accepted the following May. It consisted of two recovery wells to be located on city owned right of way and one well on the city golf course and conveyance pipelines to connect to the NAMSCO facility.

KDHE's prime contractor on the Lyons Northern Containment Project, Golder Associates, is headed by Randy March, PE, PG, manager of Golder's Denver Operations.

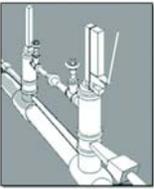
Golder has had a relationship with Lyons since 1992 when they effected the Old Mine shaft plugging. They also served as prime contractor designing and building the Lyons Southern Containment Project.

Randy and his Golder engineering team did the design work for the Northern Project. After KDHE approval they put together a request for proposal and through the bid process selected APAC Shears, Inc., Kansas Division, for the project's construction needs and the GeoCore Corporation to handle project drilling. After vendor selection was completed, a pre-construction meeting was held August 22, 2005.

Golder provided oversight for all field activities; well drilling commenced the last of August and conveyance pipeline trenching began the second week of September. The system was operational on November 23.

A two-year operation and monitoring plan has been developed to monitor and evaluate the effectiveness of the containment system with the first quarterly sampling event planned for February 15, 2006. Golder Associates is overseeing the monitoring program and will continue to be an integral party to the containment project through this evaluation period.

"The project objectives were achieved due to cooperation by a like-minded partnership of government, business, and community representatives. KDHE, NAMSCO, and the city of Lyons provided great support during the design and construction of the Lyons Northern Containment System. In addition, local landowners like the Lyons Town and Country Club worked closely with the project team so that construction-related disruption was minimized. This cooperative effort will result in significant long-term cost savings while protecting the drinking water resource in Lyons," said Randy March, Golder Associates.



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## Lyons Source Water Protection Plan Integral Part of Community Future

The Kansas Rural Water Association has been instrumental in facilitating a Source Water Protection Plan developed by the City of Lyons, Kan. The Lyons City Council approved the first of its kind source water protection plan in Kansas at a regular meeting on December 5, 2005. Only 100 such plans have been implemented nationally. This speaks highly of the commitment by Lyon's elected officials and staff to the process of developing and implementing this very beneficial plan.

Funding for the Kansas Source Water Protection Program is provided by USDA's Farm Service Agency. The Kansas Rural Water Association in cooperation with the National Rural Water Association provides technical and organizational assistance to public water suppliers to help meet community source water protection goals.

KRWA Source Water Technician, Jim Jackson, worked with Lyons community leaders on the Lyons Source Water

Planning Team from August through December 2005 to finish the project. Lyons community volunteer team members included: Lyons City Manager and team chair John Sweet; Lyons City Councilman Joseph Sedeno; Lyons Utility Manager David Kendrick; Lyons community members Kenny Wiens, Wayne Lebsack, and Rich Hill.

The team held monthly meetings in order to delineate land to be protected, identify possible pollution sources on plan property, and identify vulnerability of wellhead protection areas to those possible pollution sources. The Source Water Protection Plan is a working document that will be routinely reviewed and updated to remain current, active, and viable.

"The City of Lyons Source Water Protection Plan is an important asset for our city. The assistance from the Kansas Rural Water Association was instrumental to us in completing this plan. This important plan provides our city with enhanced abilities to protect the quality of drinking water by identifying and managing the potential sources of contamination and threatening activities that occur within our defined source water protection area," explained John Sweet. "The Northern Containment Project managed by KDHE and supported by government, state and private business entities within our area is an important part of this plan and was officially dedicated on December 6, 2005."

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