

MINUTES OF THE SENATE NATURAL RESOURCES COMMITTEE

The meeting was called to order by Chairman Carolyn McGinn at 8:30 A.M. on February 17, 2005 in Room 423-S of the Capitol.

All members were present.

Committee staff present:

Raney Gilliland, Kansas Legislative Research Department
Lisa Montgomery, Revisor of Statutes Office
Gina Poertner, Committee Secretary

Conferees appearing before the committee:

Others attending:

See attached list.

The meeting was called to order by Chairman Carolyn McGinn at 8:30 a.m. Karl Mueldener, Director of the Bureau of Water, was recognized by the Chair (Attachment 1). Mr. Mueldener gave a presentation on the sinkhole near the Burlington Northern Santa Fe (BNSF) railroad tracks in Hutchinson. Mr. Mueldener discussed the progression of the sinkhole, public safety concerns, and geologic investigations to determine how best to stabilize the area. He also discussed several other brine wells near the BNSF tracks and private residences.

Senator Lee asked who owns the land where the sinkhole is. Mr. Mueldener stated that Mosaic now owns the land and that this particular sinkhole does not encroach on any private land although it has crept onto the edge of the railroad right-of-way.

Senator McGinn asked what is being done for soil stabilization. According to Mr. Mueldener, rebar and grout have been placed in the hole to attempt stabilization. Filling the hole has also been attempted, but the shale layers collapsed. Senator McGinn also asked if they knew where the other 150 sites are and if some of these were located in residential areas. Mr. Mueldener stated that they know where to look for some due to documentation by mining companies. However, even though some were not documented and they are working on searching for others as there is a possibility that residential areas were built over the sites. The primary concern with these brine wells is topside safety.

Senator Teichman asked about records to locate wells. Mr. Mueldener said records are spotty but they have located a few. There was no registration of wells at the time they were developed.

Senator Ostmeyer requested information on the plan for the sinkhole in Ellis county. Mr. Mueldener stated that KDOT is aware of this and has performed a geologic study of the area. Apparently this sinkhole is due to an old oil or gas well. He also stated that the slower developing sinkholes can be filled in successfully and went on to discuss the concern of groundwater contamination.

Senator McGinn asked if the water was not concentrated enough to pump out. Mr. Mueldener stated that pumping out is not worth the expense at this point. She further asked if the train is in any danger of falling into the sinkhole since it is so closely located to the tracks. Mr. Mueldener stated that Mosaic brought in 60 train cars of ballast to reinforce the railroad bed to prevent this from happening. Mr. Mueldener said there are nine other wells up and down the tracks as well. Senator McGinn asked if the information provided by geophones was accurate, to which Mr. Mueldener stated that they are not perfect but do relay a substantial amount of information.

Senator Teichman asked if there are other areas that are as bad as this particular sinkhole. Mr. Mueldener said that there are some areas of concern. They do know where some active sodium solution mines are, but there are approximately 136 active wells. She further asked if the Department deals only with salt wells. Mr. Mueldener stated they do indeed deal only with salt wells.

Senator McGinn asked Rex Buchanan of the Kansas Geological Survey, for additional information. Mr. Buchanan stated that some areas need further assessment.

CONTINUATION SHEET

MINUTES OF THE Senate Natural Resources Committee at 8:30 A.M. on February 17, 2005 in Room 423-S of the Capitol.

Raney Gilliland asked if it is general theory if salt solution mine pluggings that occurred in the early 1930s are not sufficient and if that's what's causing fresh water to find a path to the salt-bearing zone below. Mr. Mueldener stated that this is not the situation with the Hutchinson sinkhole, that the well only went to 140 feet. The case that Mr. Gilliland described occurs more with oil and gas wells because they go further into the ground. Mr. Gilliland further asked if there is any speculation as to why this is happening now. Mr. Mueldener stated that in the long run, gravity wins.

Senator Lee commented on mines in southeast Kansas and Mr. Buchanan mentioned the field trip for legislators to take place in June 2005.

Senator Bruce asked if the Hutchinson sinkhole was actually a combination of two brine wells. Mr. Mueldener stated this is the case. He further asked how far the cavern stretches, to which Mr. Mueldener stated that they are trying to find out. Senator Bruce followed this by asking if it would help to relocate the railroad track to which Mr. Mueldener replied that it would cost \$600,000 to do the surface work. Senator Bruce asked if bringing in the ballast has been effective. Mr. Mueldener stated that they are reassessing this now and they are not sure if it will be effective long-term. Senator Bruce then asked if the other 150 wells need to be found. Mr. Mueldener stated that they do need to be found but that it is not clear as to who should be leading the charge on this. The Fire Marshall has been helpful.

Senator Taddiken asked if there is information on the rate of progression of the caverns enlarging. Mr. Mueldener stated that if water gets to the salt, the salt will dissolve and the water will just sit there. He then asked how big the funnel is on the Hutchinson sinkhole. According to Mr. Mueldener, this funnel is 30-80 feet.

Senator McGinn stated that this sounds like an isolated situation. She asked if it was different than the Burrton well where the salt is moving with the aquifer. Mr. Mueldener stated that this sinkhole is characteristically different.

Senator McGinn asked for approval on the minutes from 1/27/05, 1/28/05, 2/3/05, and 2/4/05. Senator Ostmeyer made a motion to approve the minutes, seconded by Senator Francisco. Motion passed by voice vote.

The meeting was adjourned at 9:30 a.m.



K A N S A S

RODERICK L. BREMBY, SECRETARY

KATHLEEN SEBELIUS, GOVERNOR

DEPARTMENT OF HEALTH AND ENVIRONMENT

Testimony to
Senate Natural Resources Committee
Hutchinson Sinkhole
Presented by Karl Mueldener & Mike Cochran
February 17, 2005

Chairperson McGinn, members of the committee, thank you for the opportunity to brief you regarding sinkholes at Hutchinson. With me is Mike Cochran, Chief of the Bureau of Water's Geology Section for KDHE.

On January 3, railroad workers reported a sinkhole near the Burlington Northern Santa Fe (BNSF) railroad tracks at the old Carey Salt plant in southeast Hutchinson. The sinkhole was originally estimated at 80 feet in diameter and 20 feet deep. Since then the sinkhole has grown to approximately 210 feet. The depth is now estimated at 20 feet from the ground surface to water, and the water estimated to be 50 feet deep. These dimensions describe only the hole visible at the surface. The cavern or void into which this material sank is probably located at the top of the underground salt layer approximately 430 feet below ground. A drawing and pictures are attached to help describe the sinkhole.

The cause of this sinkhole is an old solution mining or brine well. Salt was hydraulically mined from the underground salt layer. This mining left a cavern which collapsed causing the sinkhole. This particular brine well was drilled in 1917, ceased use for salt production in 1922, and was plugged in 1931.

This latest sinkhole at Hutchinson has been unique because of public safety concerns as the BNSF railroad tracks are nearby. Public health and safety concerns included the possibility of physical injury to Amtrak passengers, railroad personnel, and possible chemical exposure to area residents due to a derailment. The edge of the sinkhole was originally 74 feet from the tracks and is now 35 feet from the tracks. Local officials stopped traffic for several hours after discovering the sinkhole but the railroad resumed running trains although at a low speed.

Mosaic now owns the old Carey site and has been very responsible in responding to the incident. Mosaic has arranged for a local engineering firm to coordinate local activities, hired a construction contractor, and arranged geologic investigations including borings and seismic work. The Kansas Geologic Survey was contracted to perform a seismic survey to help define the problem. The geologic investigations are to locate the

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Senate Natural Resources
2/17/05

Attachment 1

underground caverns to help determine the risk and location of further sinkholes. Other geologic consultants are providing advice to Mosaic. Mosaic's Legacy Coordinator, Mr. Jim Van Nortwick, Jr., is coordinating Mosaic's work. To date we have been impressed with Mosaic's response.

The BNSF initiated construction activities last week as the sinkhole expanded towards their tracks. BNSF has a geotechnical firm on-site attempting to stabilize the sinkhole near the tracks. Two trainloads of ballast have been brought in and placed in the sink. Each train has 30 cars with each car containing 100 tons of rock. The rock fill was placed in the sinkhole using conveyor systems rather than conventional construction equipment. Additionally, subsurface grouting was done in an effort to stabilize the soil near the tracks.

At the same time, Mosaic has also been placing fill in the sinkhole. The fill is intended to stabilize the sink either by blocking the throat of the sinkhole, or by pushing the sinkhole further down. After several hours of filling underground, movement was obviously induced as there was reportedly a strong boiling action in the sinkhole water and some of the fill material sank. KDHE speculates this was due to underlying shale layers giving way and material sinking further down into the cavity. This reaction demonstrates the instability of the immediate area.

Beyond stabilizing this sinkhole, the next step is assessing the other nine brine wells also near the BNSF tracks. After assessing the wells near the BNSF tracks, we anticipate assessing the caverns in another area of this facility that borders private residences. The rest of the now defunct brine well field might not be explored, except perhaps with respect to possible impact on roadways. The future use of the land for other purposes has not been discussed.

In the longer term, there are many brine wells in the Hutchinson area. Many well locations are known and many are unknown. However, the size of the underground cavern and risk of collapse is not known. During the gas crises in 2001, six previously unknown wells were discovered when water and gas came to the surface. We need to find a method of detecting these old brine wells and assessing the caverns below. The primary issue is the danger of collapse; second is groundwater pollution. By locating the old wells and cavities, we can then assess the risk to buildings, transportation arteries, utilities and other surface activities. Discussions have just begun on addressing this legacy of salt mining. The need clearly exists to develop a response to this subsurface danger. We hope to develop some ideas, in conjunction with others, on how to locate these old wells and caverns. With this information we can then consider appropriate policies to protect the public. As usual, an important consideration will be the cost of the work and funding options.

Thank you for your time and I will be glad to answer questions.

Attachments: (pictures and drawings of sink hole and salt mining)

Sinkhole Looking North



Well #19 Casing Left of Center

KDHE Photo
1/7/05

Drill Rig and Logging Truck - Test Hole #1



KDHE Photo
1/11/05

Hutchinson Sinkhole



KDHE Photo
Used in Kansas Geological Survey News Release 1/18/05

BNSF Mainline

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KDHE Photo
1/19/05

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Kansas Geological Survey 50 Caliber Shot Seismic Energy Source

KDHE Photo
1/19/05

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Kansas Geological Survey Seismic Geophones

KDHE Photo 1-19-05

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Drill Rig for Test Hole #2



b-1

KDHE Photo
2/11/05
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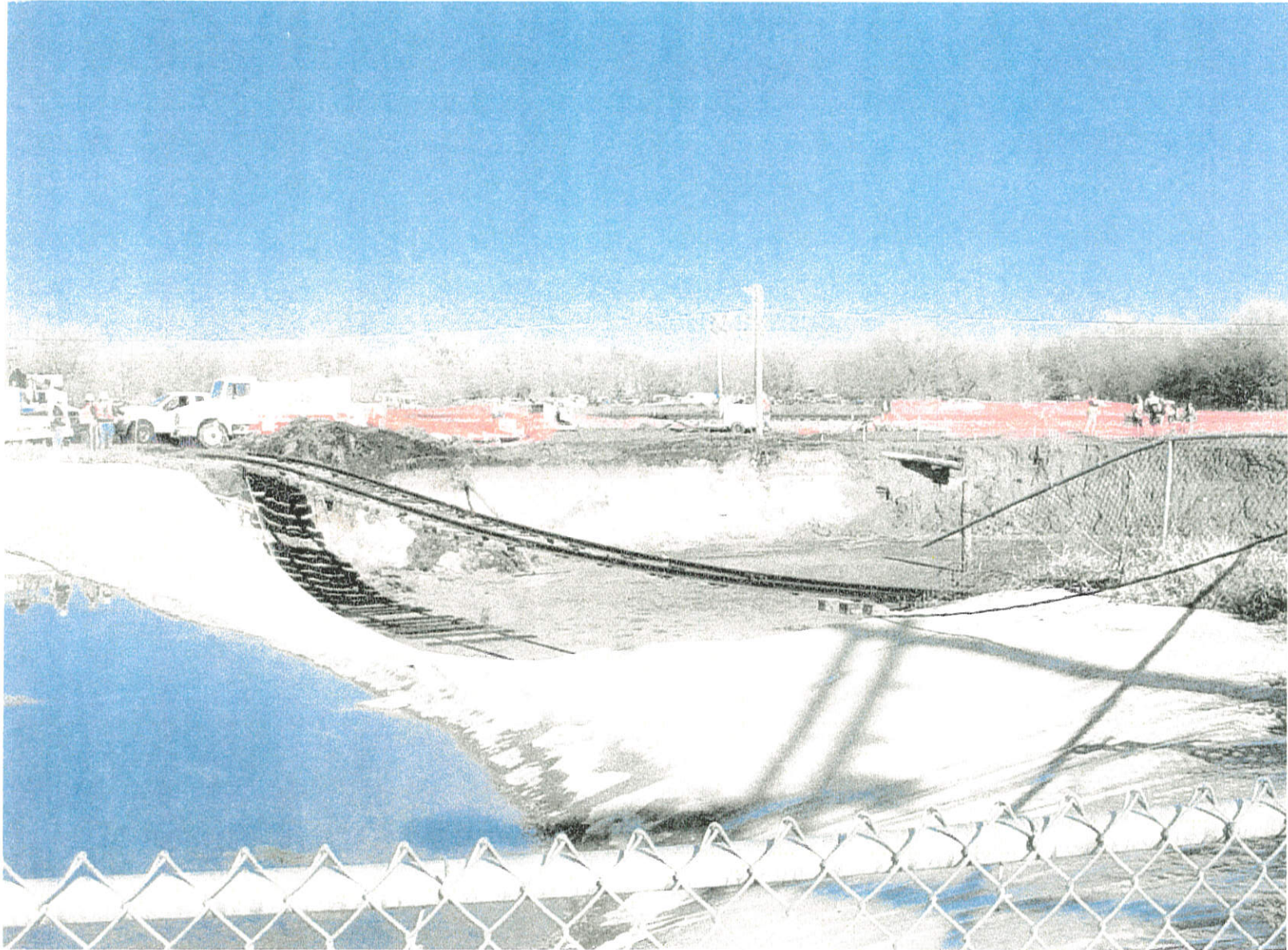
North Wall of Sinkhole Grouting

2/1/05

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Mosaic Spur Line and Old Facility Retention Pond
Well #19 Right of Center



KDHE Photo
2/3/05



Ballast Along North Side Far Left

KDHE Photo
2/10/05

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1-12

1-13



Well #19 Casing Far Right
Ballast along North Side of Far Left

KDHE Photo
2/10/05

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Boat Taking Depth Readings



KDHE Photo
2/11/05

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Boat Taking Depth Readings
Well #19 Casing Near Boat

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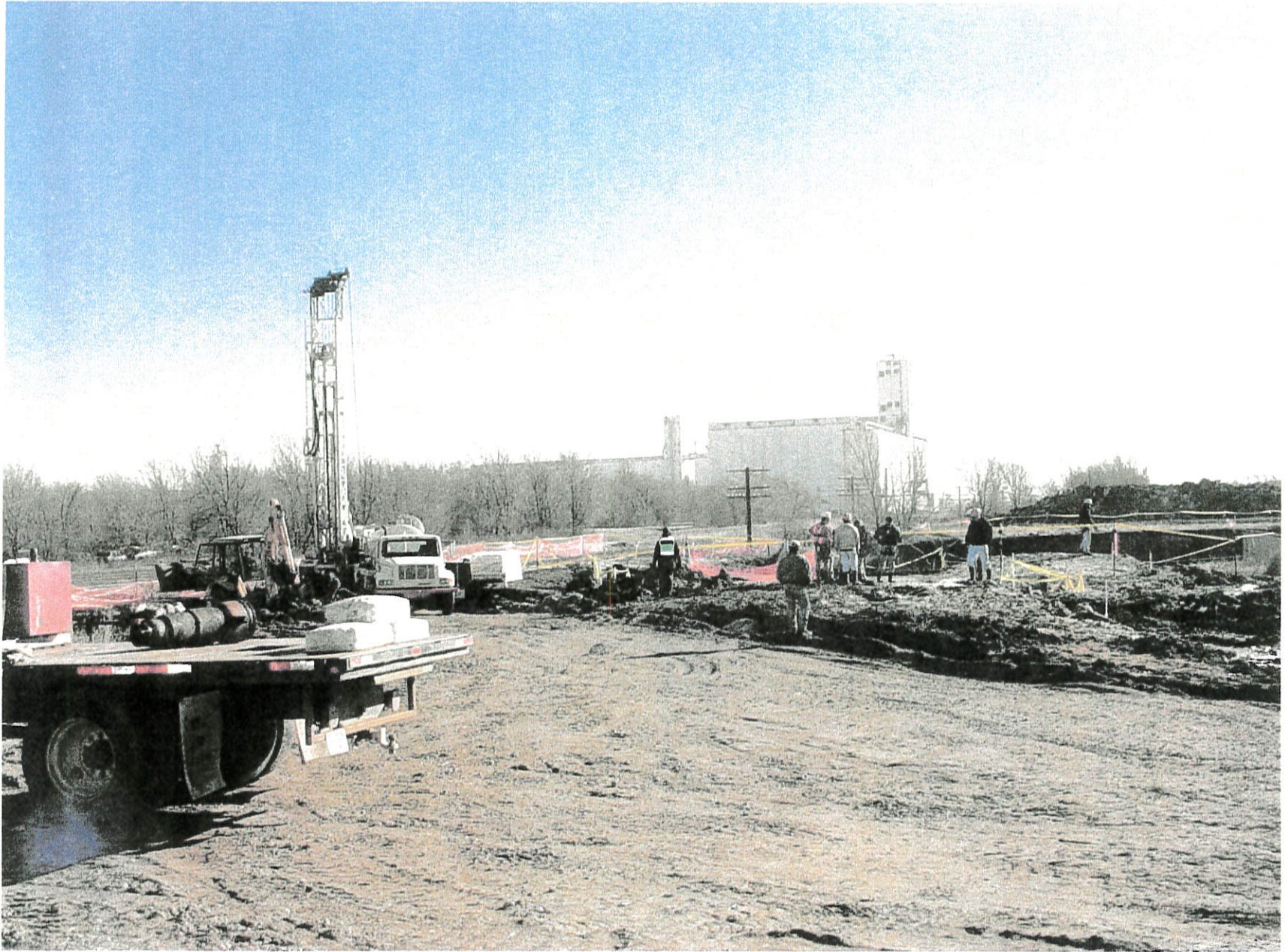


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KDHE Photo
2/11/05

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Drill Rig for Test Hole #2



KDHE Photo
2/11/05

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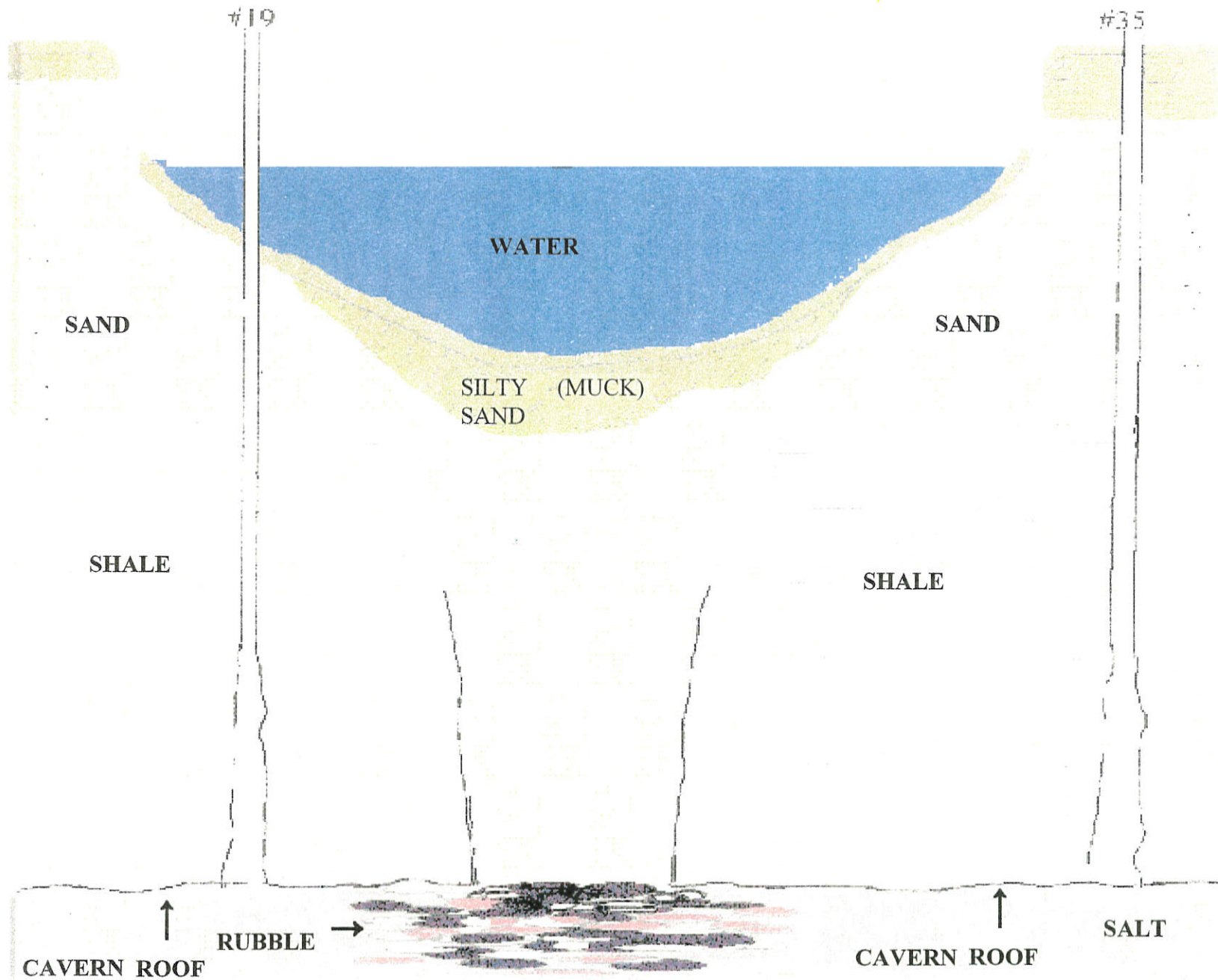
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POSSIBLE EXAMPLE AT MOSAIC FACILITY

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SW

SE

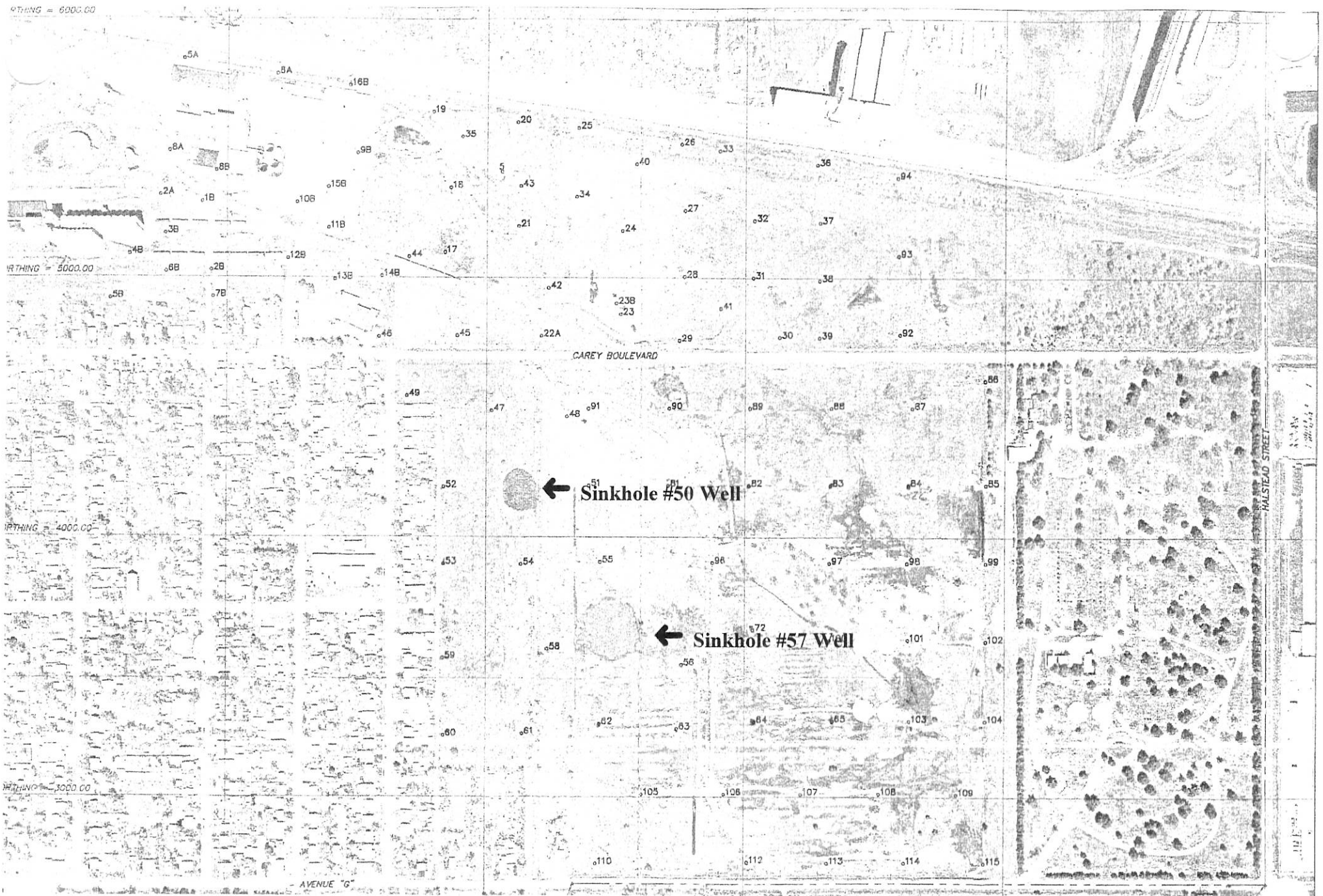


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Mosaic Brine Well Locations

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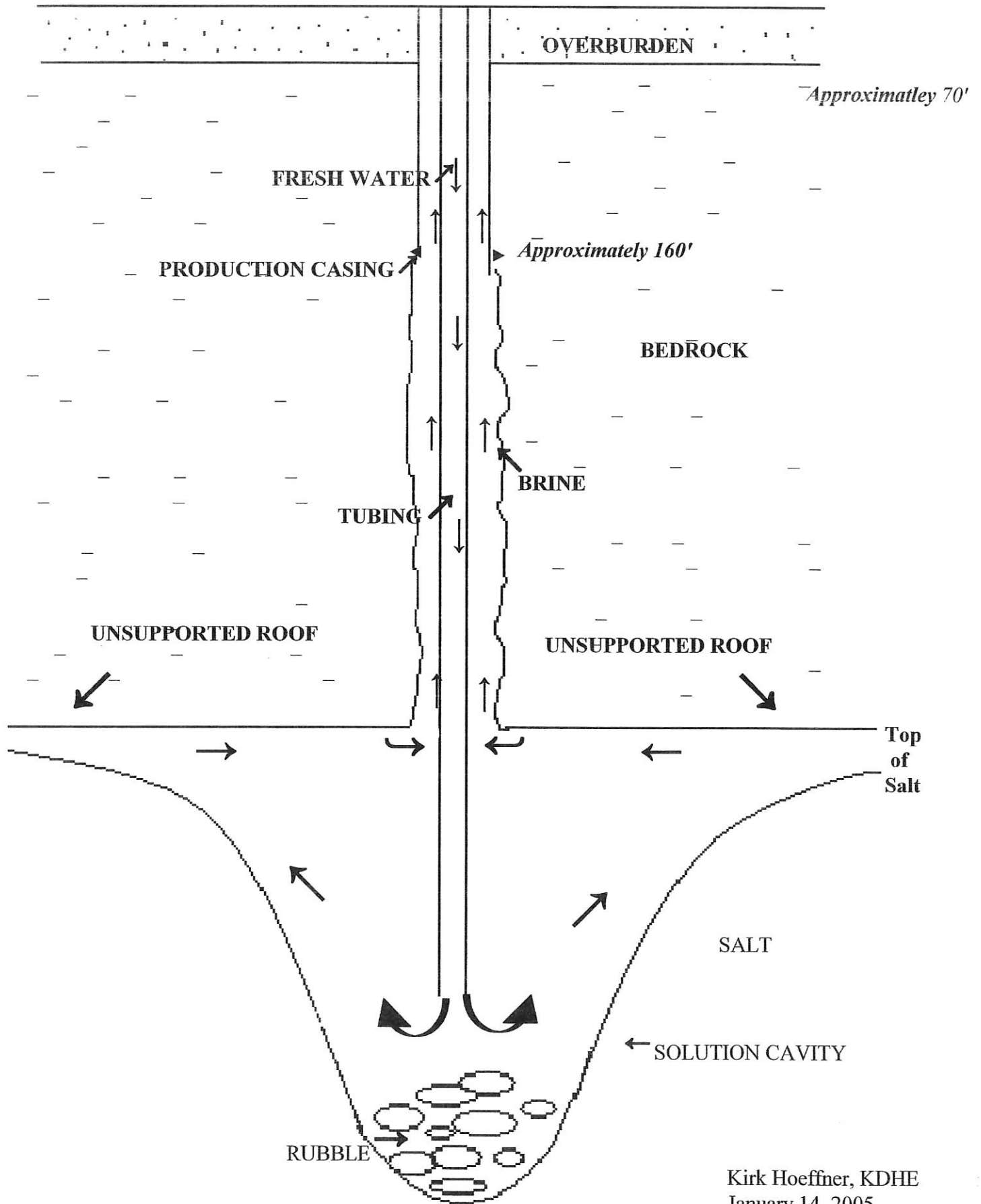


Source: BG Consultants Survey Map
November 2003

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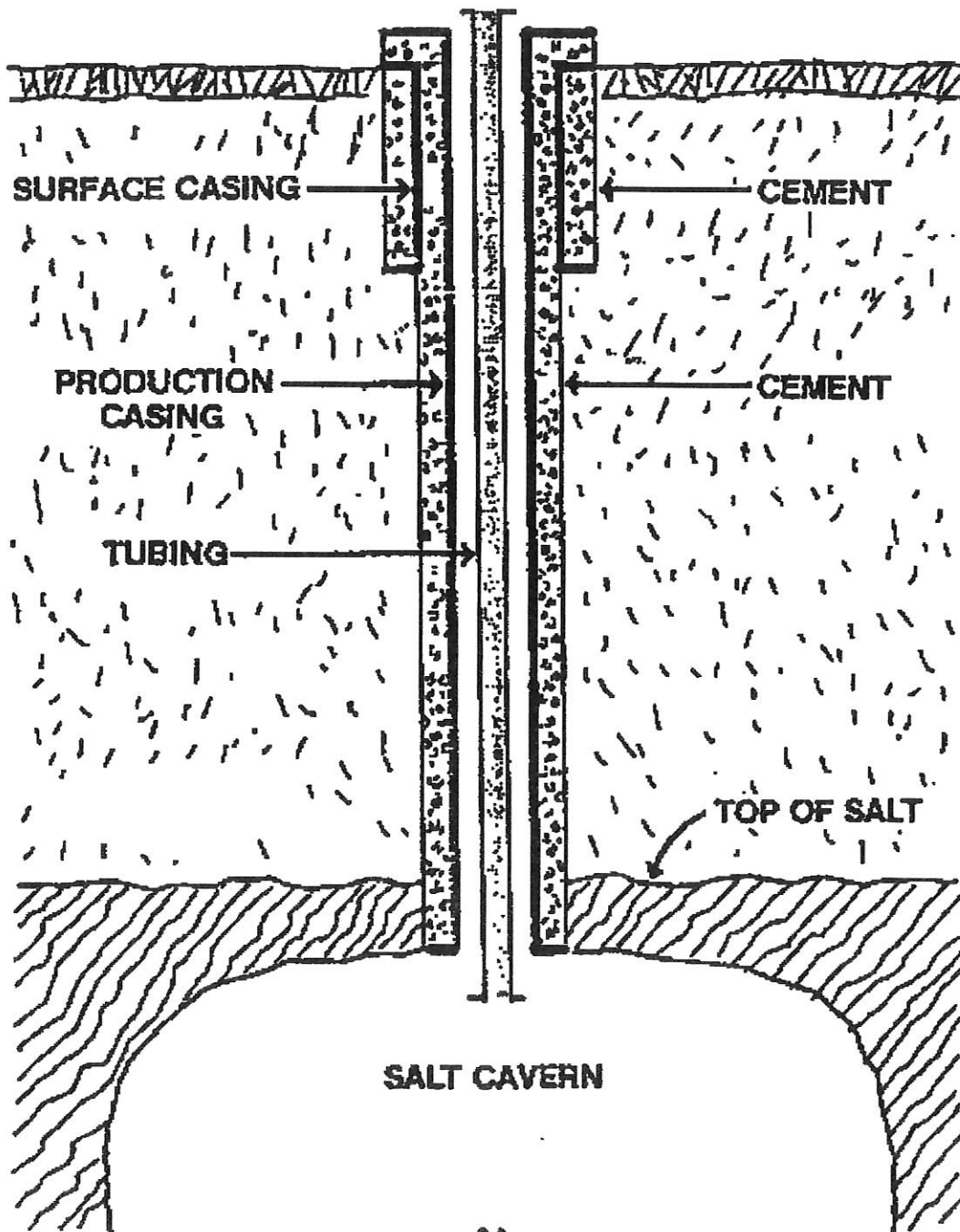
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OLD BRINE WELL, DESIGN AND OPERATION

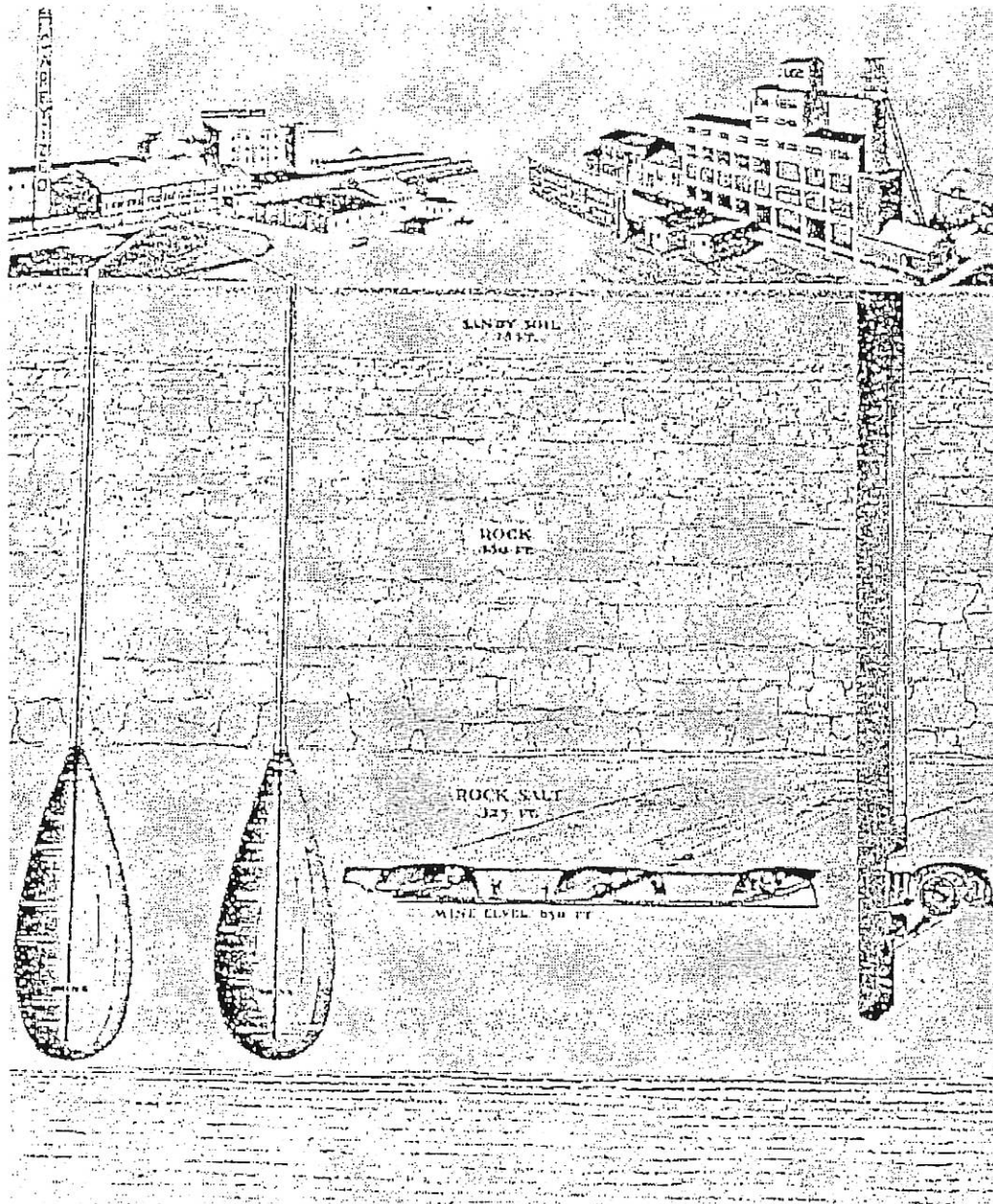


Kirk Hoeffner, KDHE
January 14, 2005

TYPICAL SALT SOLUTION MINING WELL



Kansas Salt Mines
Courtesy of Carey Salt &
Kansas Academy of Science



KS Room & Pillar Mines: Hutchinson Salt, Lyons Salt, Independent Salt (Kanopolis)

KS Salt Solution Mines: Vulcan (Clearwater), Morton (So Hutch), Cargill (Hutchinson), American Salt (Lyons)

136 active solution mining wells, 207 closed wells,
estimate 150 lost or orphaned brine wells at Hutchinson

Salt caverns/jugs used for storage of hydrocarbons: So. Hutchinson, Yaggy, Bushton, Mitchell, Conway
629 active storage caverns, 177 closed caverns