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Inventory Management and Cost Minimization of Salt

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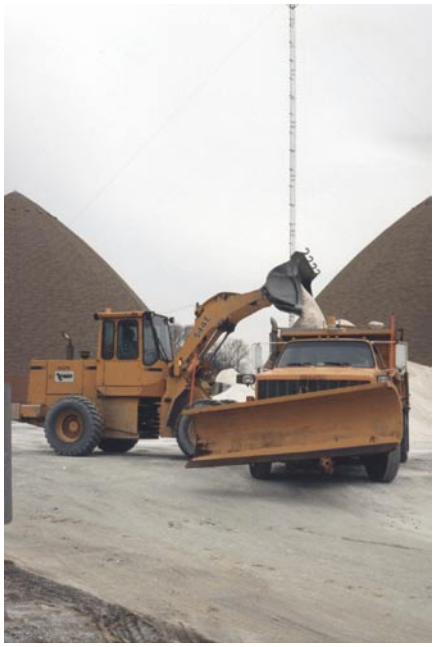
One of the most heart-burn causing situations faced by highway maintenance managers is to run low on, or out of salt during the snow and ice season. The vast majority of highway maintenance agencies do not have structural covering capacity to accommodate enough salt for a full winter season's use. As a result, a heavy reliance is placed on re-supply deliveries during the time period with the highest product demand and the worst road, rail and water shipping conditions. Significant quantities of salt are coming from "off shore" locations and there have been interruptions in that supply chain for a variety of reasons. In recent years, it seems like re-supply activities have been disrupted in one or more areas in North America, for a variety of reasons, almost every year. The 2006 - 2007 winter season was certainly one of those situations.

After a near disaster of nearly running out of salt, agencies usually implement procedures to minimize the possibility of recurrence, like generals war-gaming how to better win the last war. These reactive new procedures can significantly increase the amount their agencies expend each year on salt. As a few years go by, without re-supply problems, the fiscal management people question the extra cost and salt inventory management returns to "normal". Then, guess what happens……



There are a number of management techniques being used to keep agencies from running out of salt. These include:

- Have salt storage capacity to handle as much of the season as possible – the closer to 100%, or greater, the better.
- Do timely and anticipatory ordering of re-supply to keep at full capacity, consistent with contract requirements and storage capacity.
- Begin the winter season with salt storage structures at full capacity.
- Fully utilize storage capacity by conveyor or other loading techniques.
- Have an emergency plan in place to acquire salt and/or conserve salt in the event of serious re-supply problems.
- Pre-arrange shared services and supplies with other municipalities.
- Explore grants to fund shared municipal storage facilities.

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- Budget for purchasing salt in the Fall if storage capacity is not full at the end of the season. Many municipalities' fiscal years run from January through December. Funds may need to be held over through summer months to purchase salt in the fall.
- Be sure to inspect and maintain salt storage facilities. It is difficult to repair facilities when they are filled with salt.
- Make sure salt usage on the road is controlled to the point of applying the "right" amount of salt for prevailing weather and road conditions. Guidance in this area can be found in NCHRP Report 526 "Snow and Ice Control: Guidelines for Materials and Methods This is available on the web at: http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_rpt_526.pdf.
- Utilize covered "surge" or contingency piles, either on site or at the vendor's site, as necessary, to assure excess capacity.
- Locate and utilize other contingency salt storage facilities.
- Keep track of salt usage and remaining inventory by the most accurate means available.
- When estimating inventory from geometric measurements of stockpiles, realize that as salt consolidates in a stockpile, its density will change from about 1944 lbs/cy (unconsolidated) to about 2270 lbs/cy over a period of about one year.

There are some things that can be done to assure that you are getting the best price possible for your salt:

- Take advantage of "opportunity" pricing that is sometimes available at the end of a "light" season to fill salt storage structures.
- Establish a *quid pro quo* relationship with your long term salt supplier to **the extent possible** by trying to order "worthwhile" quantities, allowing some flexibility in the delivery schedule (there are some anecdotal data suggesting that allowing salt deliveries on nights and weekends can significantly lower the contract price), providing "prompt" payment and providing for rapid unloading of delivery trucks.
- Be careful when submitting contract quantity requirements –the closer to actual purchase, the better.
- When setting "minimum" purchasing requirements, make them as high as reasonably possible.
- Partner with other salt using agencies in your area to construct and maintain cooperative salt and liquid chemical storage facilities having the required storage capacity.
- Partner with other agencies in your area for a single salt contract that will provide a large total contract quantity.
- Be mindful that the vast majority of the cost of salt is in transportation. Structure the geographical limits of contracts to be as near as possible to points of bulk supply and provide competition to more remote locations.
- Structure contracts to provide for early, main season and late delivery, windows options, with separate pricing for each window.
- Do not overburden the contract with penalties and other disincentives. Contracts are about risk sharing, and the more of the risk burden you place on the salt supplier, the higher the price is likely to be or the fewer bidders you may attract.
- Provide for reasonable cost escalation relief in the contract. The most common item being fuel cost.

SOME OF THE ITEMS ABOVE REQUIRE ADDITIONAL DISCUSSION:

Salt Storage Capacity

This is obviously the single most important factor in assuring an adequate supply of salt throughout the winter season. It is difficult to secure financing, gain environmental approval and overcome the "not in my back yard" objections. There are some things agencies are doing to help in this area:

Build a State of the Art Facility

This is usually easier said than done. However, the recent winter should help provide some political "leverage" that can help secure funding. There may be grant money available from the environmental side of the house. Cooperative arrangements with other users in the area is becoming another popular option. There is an excellent podcast at www.wintermaintenence.com entitled "Episode 034 - Multi - Agency Salt Storage Facilities" where Bret Hodne, Maintenance Superintendent of the city of West Des Moines, Iowa, and Larry Schneider, Street Superintendent of Fort Collins, Colorado discuss two approaches to constructing, maintaining and accounting activities associated with cooperative salt storage facilities.

Construct Newer, Lower Cost, Storage Facilities

There are a number of lower cost permanent structural/storage options coming into the marketplace. Fabric and frame structures provide very cost effective storage capability.

Build Temporary Covered "Surge Piles" at the Agency Facility or the Vendor's Facility

For a premium, the salt supplier may build and cover temporary piles of salt. This task can also be performed by agency personnel. Here the siting is critical and the integrity of the cover throughout the storage life must be assured. It is usually recommended that these piles be brought into permanent covered storage at the end of the winter season.

Locate Other Sources of Salt Storage or Contingency Salt Storage that may be either Permanent or Temporary

Dave Cornett, the Assistant Director/Roadside Manager for the Kentucky Transportation Cabinet (KYTC), reported at a recent meeting at the APWA North American Snow Conference that KYTC uses a decommissioned (cave like) stone quarry to store about 55% of its estimated annual salt use for contingency. They pay for the storage in the quarry and have contracts to transport the salt to DOT locations on an as needed basis. If the salt is not needed in a particular season, it simply remains in storage until it is needed. The Louisville Metro Government also stores contingency salt at this facility. The quarry is used for storage of other items and the disposal of construction demolition and other hard wastes.

Other off-site options may include unused industrial and military complexes, unused concrete, blacktop and aggregate producing and plant facilities and unused industrial silos (having sufficient corrosion resistance).

Securing The Best Posssible Contract Price For Salt

The two most important factors in salt contract pricing are transportation and contract quantity. Sources of bulk supply include, salt mines, port/barge facilities and rail facilities. The closer delivery locations are to these facilities, the lower the contract salt price is likely to be. An agency covering a large geographic area should recognize this and create independent contracts that are structured to minimize distance from the known sources of bulk supply. Structuring contracts to provide near equal distances (competition) from sources of bulk supply is helpful if it can be accomplished.

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Inventory Management (continued from page 3)

Partnering with as many users as possible in a single contract is a very effective way to up the contract quantity and, hopefully, spur competition. However, quantity alone may not assure the lowest contract price. I am aware of situations of contracts, within the same geographical boundaries, where the higher quantity did not receive the lower contract price. This was because the higher quantity contract had more difficult delivery conditions in terms of smaller delivery quantities and/or greater delivery distances.

Try to provide price escalation features into the salt contract that further reduce the supplier's risk. A common feature is a fuel escalation provision that ties any increase in contract price to a reasonable benchmark that truly reflects the supplier's cost of doing business.

Try to set up multi-year contracts. Keep in mind that reasonable risk sharing and cost adjustment formulas will provide the best opportunity for securing a favorable contract price.

There may be other methods for controlling salt inventory and cost. However, the tips above offer a good first step.

Good luck in the upcoming season !

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