

 Ohio Department of Transportation  
Smart Salt Strategy:

# Analysis of Ohio's Road Salt Market and 2008-2009 Price Increase

Prepared by:  
The Ohio Department of Transportation  
Bid Analysis and Review Team



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## LETTER FROM THE DIRECTOR:

December 15, 2008

TO: Governor Ted Strickland

FR: Director James G. Beasley P.E./P.S.

RE: Analysis of Ohio's Road Salt Market and 2008-2009 Price Increase

Governor Strickland,

During the winter months, the Ohio Department of Transportation's top priority is keeping the state's highways and bridges safe and passable by clearing ice and snow. Since the 1930s, rock salt has been the most-utilized, cost-effective ice-fighting material for keeping roadways safe. However, Ohio is experiencing a dramatic spike in the price of rock salt this winter, with cost increases ranging from 50%-300% above last year's prices.

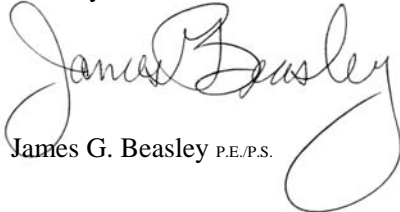
Having the ability to stockpile salt over the past year, ODOT was able to purchase a significant amount of material at last season's prices. Then through its competitive bidding process this past fall, ODOT secured contracts for additional salt deliveries for a majority - but not all - of ODOT's county forces for this season. Given the increased cost of salt this season and a growing demand to be more environmentally sensitive with salt use, ODOT developed a **Smart Salt Strategy** designed to make certain that the department is as efficient as possible with the salt on hand while still ensuring continued safety on our roads.

With this Smart Salt Strategy in place, ODOT believes its current supply of salt should be adequate to meet the state's needs for the upcoming winter season. Unfortunately, many county and local governments could not access the additional salt they will need, either due to a lack of a contracted source, higher than expected prices, or delays in anticipated deliveries.

Under your guidance, ODOT recently updated the Smart Salt Strategy to assist county and local governments who have been unable to acquire salt this year, allowing for a one-time sale of 100,000 tons of salt rationed from the department's stockpiles.

Also under your direction, ODOT has completed this analysis of Ohio's road salt market to better understand the driving forces behind this unprecedented price increase. As this report details, the market significantly departed from the state's historical experiences in terms of lower competition and higher prices. At the end of this report, we have outlined recommendations for future salt contracts which should reduce the likelihood of a repeated spike next season and improve the relationship ODOT has with its local transportation partners on securing salt supplies.

Thank you,

A handwritten signature in black ink that reads "James G. Beasley". The signature is fluid and cursive, with a large loop at the end of the last name.

James G. Beasley P.E./P.S.

## LIMITATIONS OF THIS ANALYSIS

As part of ODOT's Office of Estimating, the Bid Analysis and Review Team (BART) combines historical bid and contract information with industry-expert insights and observations of regional, national, and world market trends. For this analysis, BART researched the bids and bidding behavior experienced as part of the state's competitive process for road salt purchase and delivery. Comparing the results of State Fiscal Year 2009 with past fiscal years, the analysis reviewed the market behavior experienced both in Ohio and in neighboring states.

Under the state contract, this winter's road salt bidding resulted in several counties within ODOT's districts without bids and the remaining counties with only one responsive bidder. This year's letting results significantly depart from ODOT's historical experiences in terms of lower competition and higher prices. This report considers the economic and bidding influences of the FY 2009 salt contracts by using data from prior years and economic theory.

This report does not address the important issues surrounding the efficient use of salt nor advantages that may result from greater cooperation between the many public agencies within Ohio that consume road salt. There are many entities within the state that are responsible for ensuring safety on roadways and bridges, and many more entities which have been affected by supply, demand and other pricing factors. Any open forum which is created for the purpose of responding to higher salt prices and availability should include input from as many of these entities as possible.

## BACKGROUND: MIDWEST ROAD SALT

Dating back to the 1930s, rock salt has been the most-utilized, cost-effective ice-fighting material for keeping roadways and bridges safe during Ohio's winter seasons. While all forms of sodium chloride salt will melt ice, road-salt is attractive for its lower cost and larger size which makes it less likely to be blown off the road by moving vehicles.

In the Midwest, salt is mined from underneath the Great Lakes from locations in Ohio, Michigan, New York and Ontario, Canada. Of the five Midwest producing firms, Cargill and Morton Salt each operate a salt mine under Lake Erie. Cargill, in Cuyahoga County, produces approximately three million tons of salt annually; Morton Salt operates a mine under Lake Erie in Lake County, producing almost 900,000 tons annually<sup>1</sup>.

According to Dick Hanneman of the Salt Institute, mining salt from under the lake requires the use of heavy machinery which consumes oil and electricity. The cost of transporting salt by truck, rail or barge is dependent upon the cost of diesel fuel. In FY2008 oil and diesel prices exceeded \$147 per barrel and \$4.75 per gallon respectively, increasing the cost to mine and transport salt all across the country.

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<sup>1</sup> Ohio Department of Natural Resources, "2007 Report on Ohio Mineral Industries"  
<http://www.dnr.state.oh.us/Home/ogcim/minstat/minstat1/tabid/7798/Default.aspx>

Salt transported to Ohio from out-of-state can be extracted from Kansas but is most often mined in Louisiana. In 2008, the number of available barges was diminished as a result of several factors, including hurricanes, river flooding and higher barge operating costs. Beyond these locations, salt can be transported from South America by barge and brought up the Mississippi River at considerable expense. A fully loaded ocean-barge can haul 40,000 tons of salt.

Between 1989 and 2004, average U.S. road salt consumption among members of the National Salt Institute averaged 14.9 million tons. During the winters of 2005 and 2007, U.S. road salt sales among reporting vendors were 20.5 and 20.3 million tons respectively. Partial data for 2008 shows sales volumes are 10.3% above their equivalent 2007 level<sup>2</sup>. If this current trend continues, the U.S. will have experienced an unprecedented three major snow seasons in four years, with two of those three years setting new records for salt consumption.

Between 2002 and 2007, ODOT consumed an average of 700,000 tons of salt each year, representing 40% more salt used than the state's ten-year average of 500,000 tons. This higher level does not include the increased consumption by other Ohio agencies, including the Ohio Turnpike Commission and several local government purchasing groups. During the unusually strong 2007-2008 snow season, other Midwest states consumed significantly more road salt than average as well. Collectively the states of Wisconsin, Minnesota, Iowa and Illinois consumed 700,000 tons more of salt than average. Alone, this additional consumption by these four states is equivalent to ODOT's average road salt consumption for an entire year. Expressed as percentages, Illinois consumed 34% and Iowa 52% more salt than average during the 2007-2008 snow season.

To prepare for the coming 2008-2009 snow season, many Midwest states placed salt orders in mid-2008 to replenish both their normal holdings and reserve holdings which were consumed in the prior year. Typically states are advised by salt suppliers to keep one year's volume of salt usage in inventory; however, not all states followed this heuristic in preparation for the 2008-2009 winter and placed orders for even greater quantities of salt.

Complicating the demand and supply of road salt, states use one-year or two-year option contracts known as "80-120" or "50-150" contracts. These contracts define a singular quantity and price, but also contain two important covenants: first, the buyer only agrees to purchase a minimum percentage of the contract's volume (e.g. 80% for "80-120" contracts); Second, the buyer then has the right to purchase up to a specified percentage more than the contracts' stated quantity at the stated contract price (e.g. 120% of the contract's stated volume for an "80-120" contract). Under a "50-150" contract, suppliers are required to stockpile two extra tons of salt for every one ton they are assured will be purchased. Similarly, an "80-120" contract requires the supplier to hold one additional ton of salt for every two tons which are guaranteed to be purchased.

Another factor is the statutory requirement that ODOT purchase salt from Ohio producers when two or more in-state suppliers exist<sup>3</sup>. The guidelines used by ODOT for determining the awarded vendor are attached as Appendix 1. According to the statutes, either Morton Salt or Cargill - when selling Ohio-mined salt to the state - will win any Ohio county when both firms submit a bid. This result occurs

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<sup>2</sup> Hanneman, Dick. "1<sup>st</sup> half 2008 U.S. salt sales climb in tons, dollars", Salt Institute. 25 Sept 2008

<sup>3</sup> Invitation #018-09 Certificate for Domestic and Ohio Preference Form

regardless of submitted bid prices from other vendors, even if those outside vendors offer cheaper prices. This ability to lockout all other competitors from any and all Ohio counties undermines the efficiencies of long-term relationships between non-Ohio suppliers and state contract buyers. Price savings that might result from competition are not realized under this statute. In previous years, the regulation prevented Detroit Salt (Michigan mine), American Rock Salt (New York mine) and North American Salt (Ontario, Canada mine) from competing in ODOT salt contracts.

During the letting of the 2008-2009 state salt contracts, many southern counties did not receive any bids while northern counties typically supplied by Cargill and Morton Salt's Ohio-mines received only single bids. Using the 2008-2009 bids submitted by Cargill and Morton Salt, BART found several unexpected and perhaps questionable patterns of bidding behavior.

## **2008-2009 SALT BIDS IN OHIO and ADJOINING STATES:**

### **Intrastate Analysis:**

Cargill's relatively larger production volume over Morton Salt suggests the Ohio salt market is one of a dominant firm (Cargill) with a fringe competitor (Morton). In this type of market, standard economic theory suggests that Morton is a "price taker" while the larger Cargill sets the market equilibrium price. Cargill's production advantage suggests that the firm's profit maximizing strategy would be to bid starting in Cuyahoga County (location of Cargill's mine) and then bid on successively more distant counties until Cargill has exhausted its salt supplies, at which point the company no longer bids.

For salt contracts bid between July 10<sup>th</sup> and October 3<sup>rd</sup> of 2008, BART analyzed the bids for ODOT, the Ohio Turnpike Commission (OTC), and the Southwest Ohio Purchasers for Government (SWOP4G). What BART found was that Morton and Cargill bid vastly different prices for salt during this four month period without seeing any convergence to a single market clearing price, as standard economic theory would predict.

In July, Cargill and Morton bid OTC work at an average price of \$43.32 and \$69.22 respectively. This 60% difference in prices should have indicated that Morton needed to lower its price if it planned to effectively bid against Cargill in future months' lettings. Failing this, Cargill should have realized that it had the option to increase profits and production volumes by increasing its bid prices. Statistical analysis of the OTC bid data using standard deviations indicated with 99% confidence that a Cargill bid would beat a Morton bid.

Using the bid tabs from SWOP4G's August 28<sup>th</sup> letting and ODOT's August 26<sup>th</sup> letting, BART compared bids between vendors and observed a \$23/ton and \$30/ton difference among average ODOT and SWOP4G bids prices respectively. The bid letting results suggested that neither firm had changed their bidding behavior since the earlier July OTC letting. There was no movement toward a convergent price, as would be expected in a competitive market.

Collectively the SWOP4G and ODOT lettings sought bids for 813,000 tons of salt. Assuming that Morton had already committed some of its 900,000 tons of salt to other state and government agencies, it is very possible that Morton could have over-committed its remaining salt supplies if it had bid too aggressively

on both SWOP4G and ODOT contracts. Had Morton found itself short of the maximum amount of salt it would be contractually obligated to supply under the min-max contract rules, the firm would have had to purchase salt from its competition on the spot market. In the event that Morton couldn't find a U.S. supplier, its next option would have been to purchase salt from South America (which was selling at the time for \$154/ton<sup>4</sup>).

ODOT let its first-round salt contract (#018-09) on August 26<sup>th</sup>, 2008, and its second round contract (#318-09) two weeks later on September 5<sup>th</sup>, 2008. In the 018-09 contract, 60 of ODOT's 88 counties were provided salt bids by either Morton(15) or Cargill(45). Cargill's average bid price was \$54.41 with the lowest bid in Cuyahoga County at \$41.57 and highest bid in Belmont County at \$63.61. Morton's average bid price was \$79.19 with a low bid in Lake County at \$66.24 and the highest bid in Adams County at \$107.50. Morton's bids, however, did not conform to the rules outlined in the 018-09 contract and were therefore rejected. In a second-round letting (318-09), Cargill did not submit additional bids while Morton re-bid most of the 15 ODOT counties it bid in the first letting. The prices between Morton's first and second round bids were essentially unchanged after factoring out the differences in the terms of the two rounds of contracts.

When the bids for road salt were received from Ohio suppliers, no ODOT county received more than one bid. Because each county received only one bid from either firm, Morton and Cargill never competed head-to-head against one another. Instead, the two firms essentially created county-by-county monopolies. Critical to these county-by-county monopolies was their bidding only in the counties they won salt contracts in during the 2007-2008 season. In Northern Ohio, ODOT's Wood County contract was the only contract that switched suppliers as a result of Cargill not bidding in the first round and only Morton bidding in the second round. In Southern and South-Central Ohio, counties that were supplied salt from Louisiana did not receive bids, with the exception of a bid in Adams County by Morton Salt.

Pricing analysis for the 2008-2009 snow season shows Cargill's bids among ODOT's counties were comparable to the prices Cargill and other out-of-state suppliers offered adjoining states (\$50-\$60/ton). In Ohio, Cargill's bid prices changed proportionally to the hauling distance from the company's Cleveland mine. For example: In Cuyahoga County, Cargill quoted a price of \$41.57/ton; Fayette County in South-Central Ohio was quoted a price of \$58.50; and in Eastern Kentucky (near Ohio's southern-most point), Cargill quoted a price of \$65.01. These prices increased with the distance from the mine to the final destination, as would be expected in efficient markets.

It should be noted that this geospatial theory is altered when Cargill's stockpile locations are factored. For example: at Cargill's mine in Cuyahoga County, the price is \$41.57/ton; two counties away in Ashland, it rises 21% to \$50.16/ton; five more counties away in Hardin, the price jumps by 45% to \$60.09/ton. However, the price then drops in Pickaway County - seven counties away from the mine - to \$57.14/ton. This salt comes from Cargill's stockpile location in Columbus, not the mine near Cleveland.

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<sup>4</sup> Refer to North American's bid to Ohio DOT using a salt barge from South America in contract 318-09.

In contrast, Morton's bids were significantly higher during all FY 2009 salt lettings at \$80 to \$107 per ton<sup>5</sup>. Morton's prices also increased with transportation distances; however, this rule breaks down when we begin to examine Morton's bids across states.

In its analysis, BART was surprised that Cargill's salt mine in Cuyahoga County offered to sell salt at \$41/ton in Cuyahoga and for \$58/ton over 140 miles away in Fayette county while choosing not to bid in Lake or Geauga counties (which neighbor Cuyahoga County) or other nearby Northeast Ohio counties. As a result, Lake, Geauga and other Northeast counties contracted to purchase Morton's salt for \$64 - \$69/ton. As a result, ODOT is obligated to purchase a total of at least 86,400 tons of salt for Lake and Geauga counties at a \$24/ton premium compared to Cuyahoga County, for a total additional expense of \$153,600 in 2009.

In a separate but similar situation, Cargill did not bid Wood County in the FY 2009 contracts after winning the county in FY 2008. However, Cargill bid on the more distant Van Wert and Paulding counties. This contradicts profit-maximizing behavior in efficient markets. Again, Cargill choose to bid salt to distant counties while skipping nearby counties.

This outcome experienced by ODOT is very different from what is considered typical within a competitive market. Morton's bids were not constrained by Cargill's strong market position, and Cargill did not bid in a way that would be expected to maximize profits. Cargill did not increase its bid prices to maximize profits, and Morton did not lower its bid prices for concern of losing business to Cargill.

#### **Interstate Analysis:**

Indiana and Kentucky renewed their salt contracts in May and July respectively and received average prices for salt in the low \$50 to high \$60 per ton range<sup>6</sup>. Salt vendors - including Cargill and Morton - quoted prices which generally overlapped their competition or were very close. Neither border state uses domestic or in-state purchasing preferences. Kentucky received three bidders per each of its transportation districts.

Of concern for Ohio is the fact that Morton quoted prices to Eastern Indiana of \$56/ton while it bid the geographically closer Western Ohio counties of Williams and Defiance at \$78/ton. In a competitive market, we would expect greater transportation costs to increase the overall product's price. Yet Ohio realized higher prices for salt even as the cost to Morton to provide that salt decreased.

In Kentucky and Michigan, BART recognized the same situation. Covington and Bowling Green in Kentucky received bids from Morton at \$69/ton and \$73/ton respectively. In contrast, Adams County - just across the Ohio River from Covington - received a bid from Morton at \$107.50/ton. In Southeast Michigan, Morton bid between \$52-\$60/ton while bidding \$74-\$78/ton in Northwest Ohio. In all these situations, we observed that distance (and the typically subsequent increase in cost for transportation) did not play its expected role in Morton's bids, suggesting the presence of non-competitive markets within Ohio.

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<sup>5</sup> Refer to "FY 2009 Salt Contract Prices"

<sup>6</sup> Data from Kentucky Transportation Cabinet, as shown in Appendix 4



It's important to note that this analysis did not review the sources or shipment types for materials delivered to Ohio's neighboring states. In these instances, additional supplier stockpiles in Indiana or the routes of vendor barges to ports in Kentucky would also factor into the price differential. Thus, this dramatic change in price based solely on state lines does merit further examination.

## **IMPACT OF UNCONTROLLABLE MARKET FORCES**

The price of road salt is not much different than the cost of most other transportation commodities, which have seen significant increases over the past several years. Strong world demand for primary construction commodities and historic highs in energy prices have driven much of this inflation. As identified earlier in this report, mining salt requires the use of heavy machinery which consumes high levels of oil and electricity. Fuel prices for transporting salt - either by truck, rail or barge - add to the cost. While the prices have fluctuated throughout the year, oil exceeded \$147 per barrel and diesel prices reached \$4.75 per gallon. The cost of transporting salt from outside of Ohio has also been impacted by the higher fees and diminished number of barges available to ship salt along the Mississippi and Ohio rivers. As expected, these uncontrolled transportation costs are often passed on to the consumer.

Also uncontrollable was the harsh 2007-2008 snow season, when more than 20.3 million tons of salt was used nationally, as reported by members of the National Salt Institute. ODOT used an unprecedented 906,623 tons of salt. As a state, Ohio recorded increased consumption by several agencies, including the Ohio Turnpike Commission, several members of the County Engineers Association of Ohio, and many local communities.

Other states which also consumed record quantities last winter placed early salt orders this year to replenish their stockpiles. To no surprise, this unusual level of demand depleted supplies held by salt companies.

In a typical market, this scenario would lead to increased production to meet the growing demand (and maximize the potential profit from higher prices). Unclear, however, is the amount production quantities changed over the past ten months. In a national newspaper article, a Chicago-based spokesman for Morton Salt suggested that the company increased production at its mines after orders rose between 8 and 28 percent<sup>7</sup>. However, there has also been concern raised that production at mines in Ohio actually dropped for a period of time, despite the expectation of high demand. Further investigation into this particular matter is warranted.

## **IMPLICATIONS OF MIN-MAX CONTRACTS AND THE "BULL-WHIP EFFECT":**

The specifications of these contracts create particular problems for suppliers and complicate any economic analysis. Min-max contracts for salt require a contractor to sell a certain percentage of the contract's volume above the agreed upon amount. Even if a contractor supplies 100% of the contract's

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<sup>7</sup> "Salt shortage and high prices mean slippery roads" Associated Press, September 22, 2008

volume, the company must maintain an additional 20%-50% in reserves during the life of the contract in the event that the state decides it requires more salt.

Firms which cannot or do not provide these additional volumes upon request have two options: they can attempt to bring in salt from another mine or they can attempt to purchase salt from a competitor. Failing to do either of these, the supplier pays a penalty under its current contract and could face contractual penalties in future salt lettings.

The minimum percentage values in these contracts require the state to purchase no more than 50 to 80% of the contract's volume. As a result, a supplier is assured to sell only a fraction of the total volume of salt in the contract, but the company is legally obligated to inventory the remaining 2/3<sup>rd</sup>s of the contract's maximum volume (in a typical "50-150" contract).

In theory, the need for suppliers to maintain such large inventories of salt due to these contracts results in a considerable portion of their production being taken off the market each year. This suppresses uncommitted supply, which then typically increases prices. The resulting effect is that vendors create large inventories of salt without the ability to sell that salt to states that let their contracts later in the season or have a greater need. An example of this type of situation occurred in Kentucky during the 2007-2008 snow season. Kentucky had a brief but severe salt shortage in one area and was denied access to a 100,000 ton salt stockpile in Lexington because of a Minnesota min-max contract.

In practice, however, it has been unclear whether or when Ohio's salt vendors would have been able to deliver the full 150% or 120% of any particular contract. In many cases, the need and cost for a vendor to stockpile additional materials outweighs the penalties for failing to meet a timely delivery. In either situation, it is often the consumer who burdens the expense when these costs are built in to bid prices.

Using min-max contracts for selling salt to agencies responsible for combating winter weather also amplifies what is often referred to as the "bull-whip effect."<sup>8</sup> This well-documented effect is created when safety stockpiles (inventory) and inaccurate forecasts of demand produce amplified swings in customer orders - which can then have wide ranging effects on suppliers and prices. In the 2007-2008 snow season, many states consumed all of their normal salt storage and had to access secondary reserves. To compensate for this heavy usage, many states let contracts which would replenish both their normal inventories and their depleted reserves before the 2008-2009 season. This effort to quickly refill all inventories created a demand spike that was made even more extreme by the use of min-max contracts. Vendors working at full capacity have struggled to meet demand in 2008, causing higher salt prices and pushing states to purchase internationally mined salt at over \$150/ton.

Finally, an inherent challenge in the min-max contract is determining which end of the spectrum is most important: frugality suggests the state would want to buy the least it is required to purchase, but caution suggests the state must guarantee it can access enough material in a "worst case" scenario. If the minimum is set too high, the state may be forced to build more storage capacity. If the maximum is set too low, the state may be unable to refill stockpiles after the winter months are over.

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<sup>8</sup> Also known as the "Forrester Effect", refer to [http://en.wikipedia.org/wiki/Bullwhip\\_effect](http://en.wikipedia.org/wiki/Bullwhip_effect) for more information

## CONCLUSION:

In a properly functioning market, we would expect each firm to start its bidding in nearby counties and then subsequently bid in increasingly distant counties. In competitive markets, the submitted bid prices would increase relative to the distance from the mine, relative to increasing transportation costs. Eventually, the vendor would exhaust its salt supply and stop submitting bids.

During the 2008-2009 salt contracting process, BART did not witness this behavior in either its intrastate or its interstate analyses. This suggests that standard market patterns do not work for this particular commodity or outside forces altered the state's competitive bidding process.

In the actual bidding process, Ohio's two state-located salt firms bid in a way that most easily segmented the Ohio market into two monopolies, preventing competition and ensuring that neither firm would end up over-committing its supplies. Because the monopolistic regions were based upon the prior year's county contract winner, transportation costs did not play a proper role in helping to determine the lowest cost bidder per county in the current year. Savings to ODOT and its local transportation partners - savings that would normally be realized in a competitive bidding environment - were negated as part of the process of dividing the Ohio market into county-by-county monopolies where prices in one county could be nearly \$30/ton more than its neighboring county simply because the counties used different vendors<sup>9</sup>.

Clearly, certain uncontrollable market forces impacted the cost of salt this year: record high fuel and energy prices combined with the national economic downturn have dramatically affected prices on a wide range of commodities. Even more difficult to control is the weather, which delivered to Ohio and its neighboring Midwestern states a prolonged winter season last year. With more than 20 million tons of salt being used in one season, it should be expected that supplies would be impacted<sup>10</sup>. What does warrant further investigation is the level of production at salt mines in Ohio to determine whether production was changed to meet demand or to influence price.

While skepticism has been expressed in the way that Morton and Cargill bid in FY 2009, it is important to recognize that contractual penalties found in the state's typical min-max contracts might also have impacted supply and price. These penalties make it critical for salt suppliers not to over-commit supplies. In the state's bid process, neither the suppliers nor the state know the bidding outcomes until after the bids are opened. Suppliers cannot control the volume of work they will actually win, but can control the maximum amount of work they can win. Compounding this issue are the penalties associated with min-max contracts. A firm that aggressively competes - and as a result wins more contracts than it anticipates - may struggle not only to meet the regular volume requirements stated in the contracts, but will be additionally burdened with storing a large volume of reserve salt as per the contract's maximum statute. These influences create a reason for firms to desire a situation in which they can be certain of winning a very specific volume of work with low uncertainty.

The risk of over-committing is proportional to the volume of the contract(s) let at any one time. As a result, a risk-averse supplier will have to bid on less salt than is desirable by the state to assure that the supplier does not over-commit its resources. Reviewing Ohio's bid timing during FY 2009 between

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<sup>9</sup> Compare Portage County at \$43.20/ton to Mahoning County at \$70.90/ton

<sup>10</sup> "Salt shortage and high prices mean slippery roads" Associated Press, September 22, 2008

August 26<sup>th</sup> and August 28<sup>th</sup>, the state let 813,000 tons worth of salt contracts<sup>11</sup>. A vendor that wanted to sell all of its finite salt supply during this week would have had to weigh both the impact of min-max contracts along with the impact of winning too many bids in general, if it bid prices too competitively.

From a market analysis, it appears that the primary objective of these firms was to minimize the danger of over-commitment, blamed in part on their limited supplies. The dangers of being “too competitive” curtailed competitiveness in the bid process. As a result, vendors quoted salt prices that did not represent the full downward price pressure from market competition. When suppliers have an incentive to know the volume of work they will each win they can maximize their salt sales without risking over-commitment penalties by predetermining which contracts they will bid and which ones they will not bid. Although both scenarios result in reduced competition and higher prices, practicing the latter may violate state or federal antitrust laws by restraining trade.

## **RECOMMENDATIONS:**

Faced with the challenge of higher costs and uncertain supply, ODOT has already developed a Smart Salt Strategy designed to make certain that the department is as efficient as possible with the salt on hand while still ensuring continued safety on our roads. In addition to being more environmentally sensitive with salt use, ODOT’s Smart Salt Strategy is the first logical step in controlling the expenditure of dollars for ice-fighting materials. BART offers these other recommendations which would impact the salt market and potentially improve the state’s competitive bidding process.

### **1) Review Ohio’s natural salt supply and improve future delivery methods**

In coordination with the Ohio Department of Natural Resources, the state should review the current and future levels of Ohio’s salt supply coming from the mines along Lake Erie. Prior to the next winter season, the state should have the best information possible as to whether current supply can meet demand. Moreover, the state must best understand the timing of production and how long increased production takes to meet delivery needs. This includes a review of vendor stockpiles, which are not perfectly divided for serving all of Ohio’s 88 counties. At the same time, ODOT should review the delivery methods of salt vendors to identify potential bottlenecks which impede delivery or opportunities to shift delivery to alternative modes of transportation. By exploring other modes of shipping freight, transportation costs could be reduced and Ohio could open the door for improved competition among vendors in more areas of the state.

### **2) Revise domestic preference procurement statutes on salt**

There is no argument that state dollars should be prioritized to support Ohio companies and Ohio workers, but the state’s commitment to investing at home should not be an excuse for vendors to dismiss the role of competition. Revising the current domestic and Ohio preference procurement statutes will encourage more open competition for Ohio salt consumers. Enticing needed competition from Michigan and New York vendors could eliminate the type of county-by-county monopolization behavior that reduces the effectiveness of the state’s funds. By adjusting these stipulations, Ohio could reduce the unfavorable price differentials reported in BART’s interstate

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<sup>11</sup> ODOT and SWOP4G contracts let during the week of August 25, 2008, totaling 813,000 tons

analysis. Furthermore, greater competition may remove the significant price differential experienced among adjacent Ohio counties.

### **3) Minimize the swing of min-max contracts and contract with greater precision**

Min-max contracts create considerable problems for efficient markets by artificially constraining supply. To profitably bid such contracts, suppliers must add to their quoted prices the cost of stockpiling considerable amounts of excess salt that may or may not be consumed that year. Such stockpiling keeps salt from being used when and where it is most needed. Allowing the markets to dictate the movement of salt supplies removes the burden of state and local agencies having to act as secondary brokers to ensure every road-maintaining agent has salt. Using a “50-150” contract as an example, to sell one ton of salt a contractor must bid a price that reflects the cost of mining three tons of salt for every one ton of assured sales. The state and its transportation partners should consider adjusting the range on these min-max contracts.

ODOT’s Smart Salt Strategy is an important step in carefully monitoring how and when the department uses salt treatments to improve driving safety. While snow-fighting is not an exact science or a statistical equation, the department and its transportation partners must gauge with great precision the amount of salt needed in an average year. By determining a more precise need, the state can further minimize the range and reduce the inventory swings that have contributed to the recent salt price volatility. However, great caution should be given to ensuring that the range does not overburden the state’s ability to stockpile salt or its access to emergency reserves.

### **4) Change timing of bidding process**

In counties where the Ohio Turnpike Commission stores their salt, Cargill submitted bids between \$41 and \$47 per ton. In those same counties, ODOT received bids between \$42 and \$53 per ton. Among Morton’s bids in Northwest Ohio, there was no statistical difference between how the company bid OTC’s and ODOT’s lettings; both agencies are being charged prices in the mid-\$70 range per ton of salt for FY 2009. Thus, the timing of ODOT’s bid compared to other Ohio entities was unlikely a factor in this year’s price increase. Our neighboring states of Indiana and Kentucky bid their salt contracts as multi-year contracts with their out-of-state salt suppliers, which may have influenced price because salt was less expensive during 2007 and bidding was more competitive. The rush of other states (most notably Wisconsin, Minnesota, Iowa and Illinois) to replenish depleted stockpiles did likely have an impact on Ohio’s access to salt. As part of a review of future contracting, ODOT should look at the timing and length of its contracts. Coordination instead of competition among other states could reduce the likelihood of unbalanced shortages and supplies.

Also, ODOT has typically been able to re-fill storage barns in the spring and summer using contracts which end in August. This past approach has proven beneficial to ODOT but may not be possible for the current winter season, as ODOT has already committed to rationing 100,000 tons of its reserve to assist local communities. For this season and subsequent seasons, a late spring contract could be bid to fill storage facilities, at a time when the amount needed is known. However, if vendors continue to have short supplies of salt, a bid letting in early Spring may prove unfruitful.

#### **5) Co-op with other agencies to improve inventory management and communications**

ODOT currently allows counties, townships and local municipalities to participate on its salt contracts. The state should encourage more local governments to work closely with ODOT to purchase salt. While it is understandable to maintain inventory levels, keeping excessive inventory or having inventories in areas where that quantity of salt is not needed creates an inefficient use of salt. All Ohio agencies responsible for road salting should work together to develop an information network which allows every agency in the network to buy and sell salt between one another, thereby allowing agents with too much and those with too little to share their pre-existing salt inventories before purchasing more salt from the mines. This ability to share should also influence the determination of ranges on min-max contracts.

Such a model could generate money-saving benefits especially when an adjacent county is being supplied from Cargill at the \$40 range and a neighbor is being supplied by Morton at the \$70 range. In such instances, Cargill-supplied counties could consider fully utilizing their Cargill contracts this season by purchasing the maximum amount of salt allotted and then “selling” the excess to their Morton-supplied neighbors. Morton-supplied counties should also proactively contact their Cargill-supplied neighboring counties when in need of salt before contacting Morton.

#### **6) Continue analysis of Ohio’s road salt market and 2008-2009 price increase**

Admittedly, this analysis is limited to the historical data and market trends available to BART, as collected in a relatively short amount of time. As depicted in this report, this analysis revealed certain questionable patterns of bidding behavior. These patterns may warrant continued analysis at higher levels, potentially including review by the Attorney General’s Office, if appropriate.

## APPENDIX 1: DOMESTIC AND OHIO PREFERENCE GUIDE

### LOW SALT BIDS

#### IF CANADIAN OR OTHER FOREIGN SALT IS LOW BID:

1. Follow R.C. 5513.07 and apply 6% to Canadian/Foreign bid (BUY AMERICA).
2. If still low, look for 2 or more bids offering salt mined in Ohio (R.C. 125.11(B)).  
If 2 or more bids offer salt mined in Ohio, **AWARD** to low Ohio-mine bidder.
3. If there is only one Ohio-mine bid and/or border state bids offering salt mined from the border state, apply the 5% preference (BUY OHIO).  
If Ohio-mine or border state is low, **AWARD** to low Ohio-mine or border state bidder  
If the Canadian bid is still low, **AWARD** to low Canadian/Foreign bidder.
4. If there are no Ohio-mine or border state bids, **AWARD** to low Canadian/Foreign bidder.

#### IF NON-BORDER STATE IS LOW BID:

1. Look for 2 or more bids offering salt mined in Ohio (R.C. 125.11(B)).  
If 2 or more bids offering salt mined in Ohio, **AWARD** to low Ohio-mined bid.
2. If there is only one Ohio-mined bid and/or border state bids offering salt mined from the border state, apply the 5% preference (BUY OHIO).  
— If Ohio-mined or border state is low, **AWARD** to low Ohio-mined or border state bid  
If non-border state bid is still low, **AWARD** to low non-border state bid
3. If there are no Ohio-mined or border state bids, **AWARD** to low non-border state bidder.

#### IF BORDER STATE IS LOW BID:

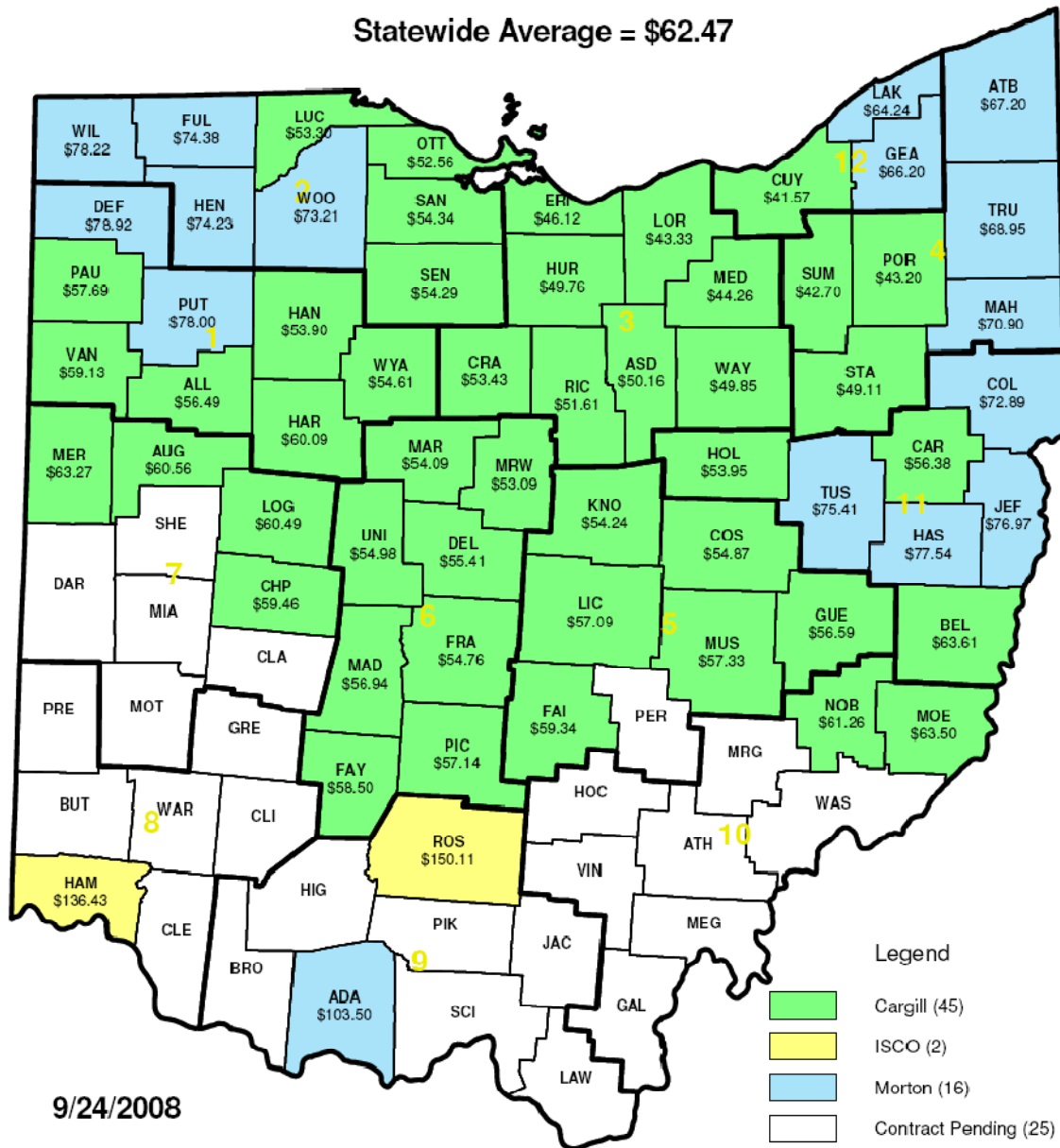
1. Look for 2 or more bids offering salt mined in Ohio (R.C. 125.11(B)).  
If 2 or more bids offering salt mined in Ohio, **AWARD** to low Ohio-mined bidder.
2. If there is only one Ohio-mined bid, **AWARD** to low border state bidder.
3. If there are no Ohio-mined bids, **AWARD** to low border state bidder.

## APPENDIX 2: FY 2009 ODOT SALT DELIVERY CONTRACT PRICES MAP

\* Prices only reflect cost of salt (material and delivery) to ODOT or Locals on state co-op contract. It does not necessarily represent the salt cost to the local County Engineer or municipalities that bid separately from the state contract.

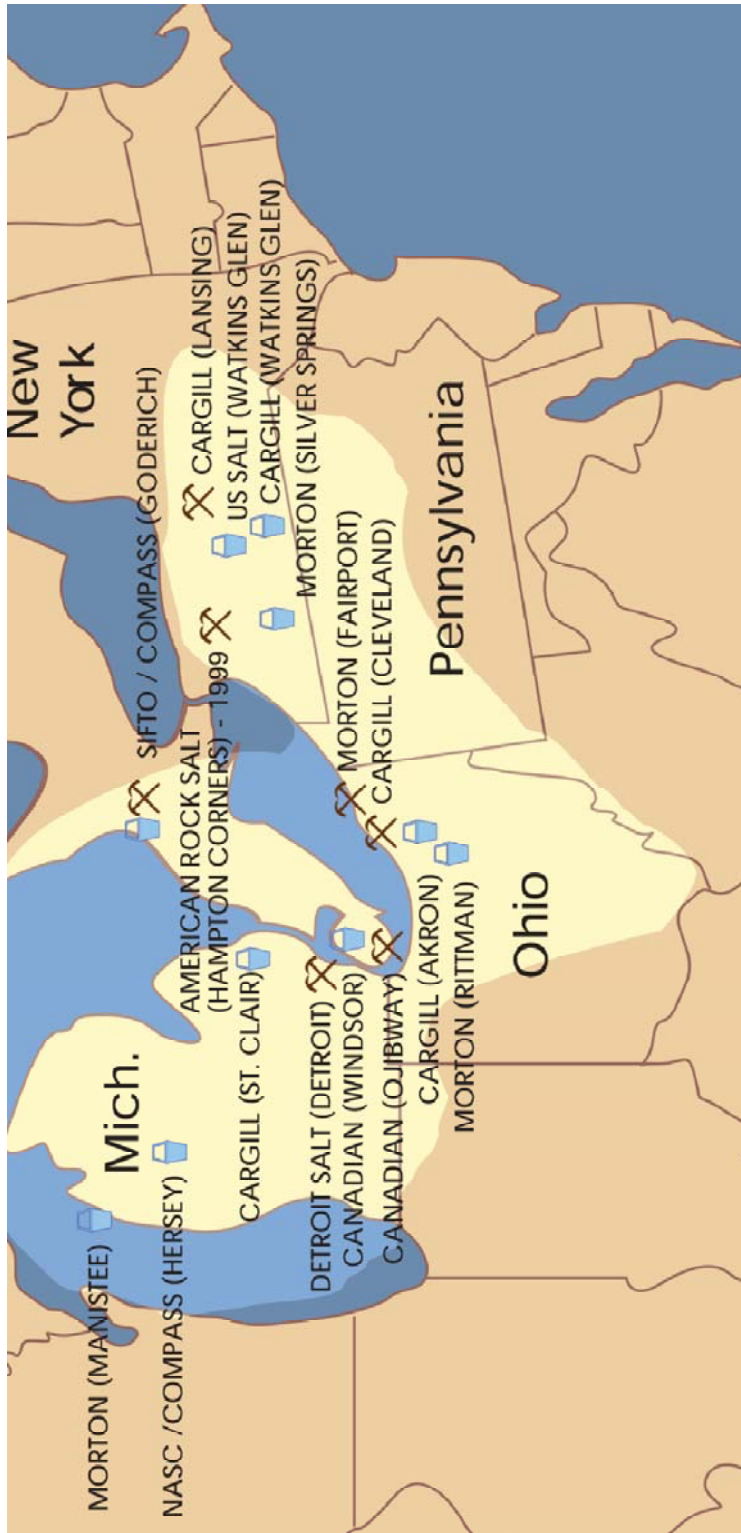
# FY 2009 Salt Contract Prices

Statewide Average = \$62.47





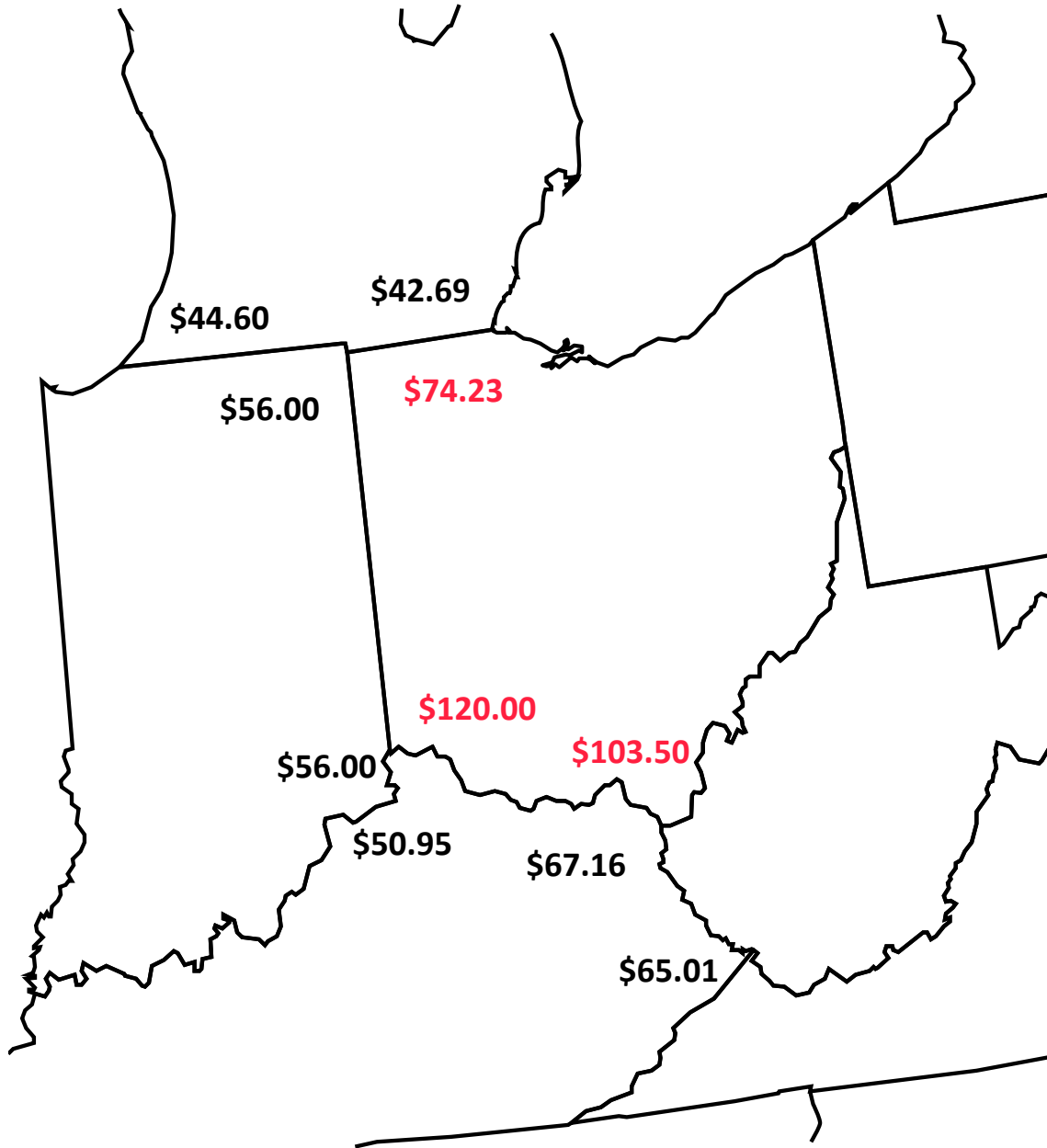
APPENDIX 3: REGIONAL SALT PRODUCERS



Source: Salt Institute, <http://www.saltinstitute.org/images/map.pdf>

APPENDIX 4: ADJOINING STATE AWARD PRICES MAP

with comparison to Ohio bids by Morton Salt



Source: ODOT, Bid Analysis and Review Team