

AGENDA

CITY COUNCIL WORK SESSION

August 17, 2020

4:00 PM, City Council Chambers
130 S Galena Street, Aspen



WEBEX

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I. WORK SESSION

- I.A. De-icing Considerations for Winter 2020
- I.B. Goal #7 Update- Stormwater/Clean River Program Funding



MEMORANDUM

TO: Mayor and City Council

FROM: April Long, P.E., Clean River Program Manager
Jerry Nye, Superintendent of Streets

THROUGH: Trish Aragon, P.E., City Engineer
Scott Miller, Public Works Director

MEMO DATE: August 14, 2020

MEETING DATE: August 17, 2020

RE: Winter Snow Removal Operations and Deicer Use

REQUEST OF COUNCIL: Request limited and strategic use of deicing materials to monitor water quality impacts and vehicle and pedestrian safety improvements through the winter of 2020.

SUMMARY AND BACKGROUND:

The main winter-time goals for the City of Aspen Streets Department are to provide snow and ice control and to keep the streets clear of dust and gravel in a professional and proactive manner. Snow and ice can be managed through mechanical means, such as plowing, and through chemical means, with the assistance of de-icing agents. The most common de-icing agent, salt, is often used in snowy/icy climates to improve driver and pedestrian safety. “Salting” roads works by altering the freezing point of water. Water with a higher salt content has a lower freezing point than water with less salinity. Therefore, when salt is applied to a surface, it leads to melting and prevents falling snow or rain from being able to freeze on that surface.

While the application can improve driving conditions, salt and other chemical de-icing agents can have serious negative effects on aquatic ecosystems. Like many other communities, the City of Aspen (City) stopped using chemical de-icers, generally liquid magnesium chloride, in 2002 due to concerns for the environment and water quality. Since that time the City has used aggressive plowing and the application of 3/8” washed rock chips (“sand”) as the only mechanisms to improve road traction and to minimize or prevent sliding on snowy/icy roads. (Note: The City’s Parks Department currently uses a magnesium chloride and sodium chloride blend called “Snow Plow” in limited locations (areas of known hazards) throughout the core of the City, mostly sidewalks and alley crossings).

Environmental Impacts of Sand - This “sand” presents its own environmental impacts, especially as it is ground down to a finer particle that is more easily carried in snowmelt into the City’s stormwater system and discharged into the Roaring Fork River (River) or its tributaries. In fact, TSS (total suspended solids, fine particles, or “sediment”) is the primary pollutant of concern for the City of Aspen’s Clean River Program.

Because sediment can degrade water quality, the City works diligently to reduce the amount of road sand that reaches the Roaring Fork River. The Streets Department estimates that half of the sand applied is later removed through the snow removal process and winter street sweeping. Additionally, four of the City’s eight major outfalls into the River have been armored with extensive pollutant removal facilities. These facilities are performing excellently based on data gathered in summer months. Less is known about the effectiveness of these facilities in winter months because monitoring has only been conducted in summer months.

Traffic Impacts of Sand - The use of sand for traction has challenges, as well. Because the sanding material consists of small, hard rock chips, it does not stick to the icy surface of the street in the driving lanes - the material bounces away from where it is applied and actually needs to be. Vehicles also kick the rock chips to the side of the roadway when driving over them. Sand is easily covered up by very small snowfall amounts and is picked up during plow operations causing the need for repeated application as the snow accumulates during a storm. RFTA has had to stop service on numerous occasions until enough sand can be reapplied to give buses adequate traction to continue their service.

Accident Information –

Figures 1 and 2 show the number of winter-season traffic accidents by street location, with darker (redder) lines indicating more reported traffic accidents. Detailed research would be required to determine how many traffic accidents that occur in the winter are attributable to road conditions. However, several of the streets where numerous accidents have occurred align with the streets that require heavy sand application by the City’s Streets Department (blue under-laying lines).

RFTA Concerns –

RFTA operates about 700-800 bus trips a day during the winter season in and out of Aspen. Icy streets greatly hampers their ability to operate safely and maintain a schedule. At times during the winter RFTA has had to cease operations entirely due to street conditions that are considered unsafe to operate transit operations.

One of the most critical areas that needs limited de-icing is the Durant Street area and around the Rubey Park transit facility. All valley, BRT, local City and skier shuttle operate through this area. The steep slope and crown of Durant street combined with icy conditions greatly impacts transit operations and in turn impacts skiers, commuters, workers and visitors using the transit system. A limited de-icing program could help to resolve some of these problems. Additionally, RFTA regularly requests more extensive snow and ice removal on Park Circle, Park Ave, Mountain Valley, Doolittle, Cemetery Lane, Aspen Street, and Main Street, and at the intersections of Spring and Main and Spring and Cooper.

Insurance on transit buses is expensive. The deductible on a \$550,000 diesel bus is \$100,000. We are now introducing electric buses into the fleet at a cost of \$1 million per bus. It is important to try to protect these more expensive assets with a limited de-icing program.

Current Winter Streets Operations –The Streets Department currently prioritizes snow removal operations as follows:

| Snow Removal / Control and Sanding Street Prioritization | | | |
|---|---|------------------------|--|
| Priority | Location | Treatment | Level of Service |
| 1 | RFTA and school bus routes and primary access routes for emergency vehicles | Snow plowing / Sanding | Removal when 3 inches of snow is accumulated |
| 2 | Main Street and Commercial Core | Snow plowing / Sanding | Removal when 3 inches of snow is accumulated |
| 3 | Residential Areas | Snow plowing | Plow when 3 inches of snow is accumulated |

A typical snow removal operation involves hauling an average of approximately 285 truckloads a night. The operation starts at midnight and ends when the priority routes for transit and emergency vehicles, the downtown core, and Main Street are completed, with every effort being made to have the core cleared before the increase in traffic at about 7am. The highest hauled load night was 365 loads in 10 hours.

The following equipment and personnel are necessary for effective snow and ice control in an average winter season:

| Amount | Staff / Equipment / Resource |
|---------------|---|
| 8 | Heavy Equipment Operators |
| 3 | Motor Graders |
| 2 | Front end loaders |
| 2 | Sand trucks with attached plows |
| 1 | Snow blower attachment |
| 20 | Rental Trucks (for hauling to snow dump site) |

Sand is applied for traction when any accumulation of snow or ice is present on roadways and again after snow is plowed (which removes any previously-applied sand). Heavily sanded locations, identified in blue in Figures 1 and 2 are in effort to reduce vehicle accidents, address RFTA bus stops and concerns and in response to pedestrian accidents. The Streets Department maintains storage and supply for approximately 180 tons (13 dump truck loads) of sand on site each winter, with an average application volume of 477 tons (43 dump truck loads). Sand that remains on streets after snowstorm events is removed by street sweeping.

All removed material, snow and sand, is transported to City’s snow-dump site located near the airport and adjacent to the Aspen/Pitkin animal shelter. The snow dump site is roughly 2.3 acres. Snow is left to melt naturally and the runoff water is captured onsite in a retaining pond which infiltrates into the ground. The State of Colorado has released the city of any testing requirements after ten years of successful soil and water monitoring and test results.

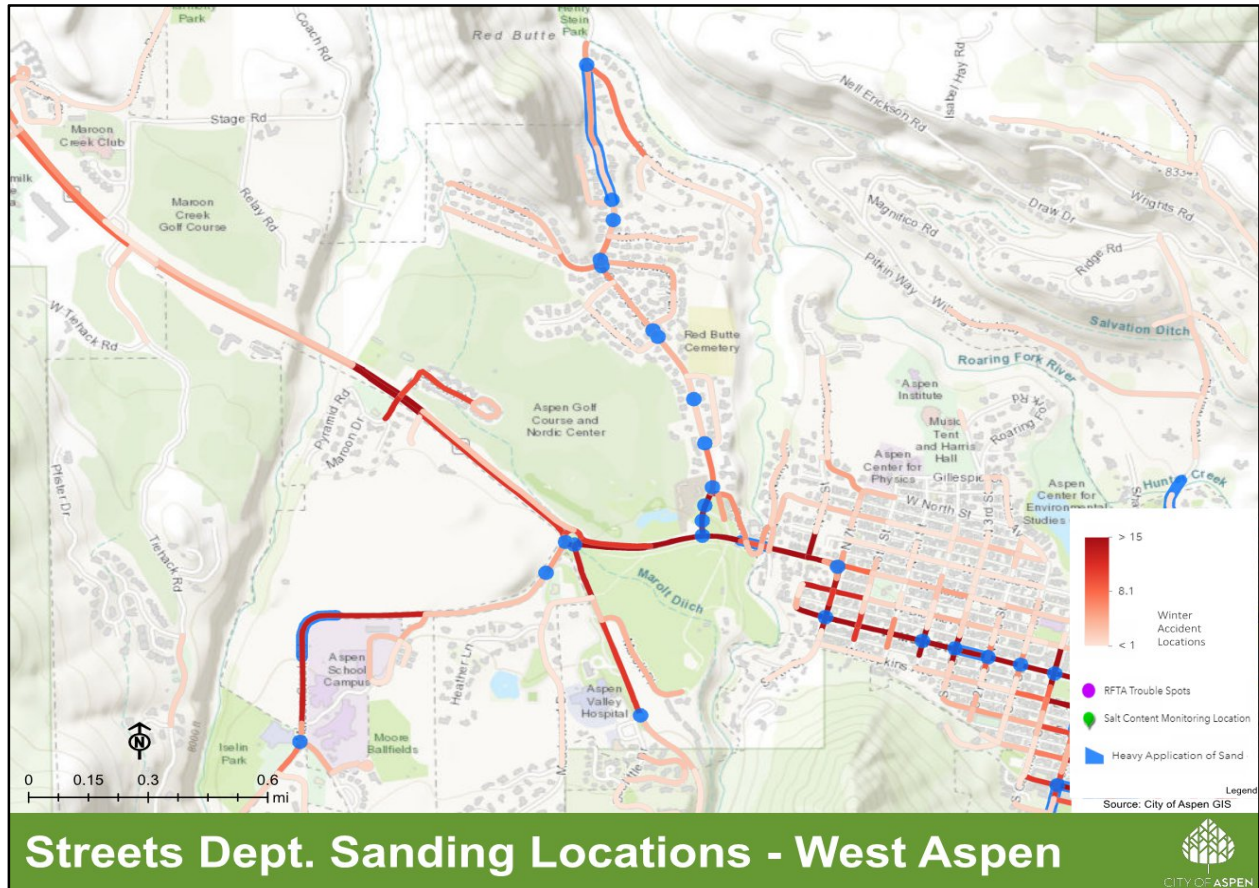


Figure 1. Variations of red indicate number of winter-time accidents, with dark red indicating more accidents. Blue dots and lines indicate areas of heavy sanding by Streets Department.

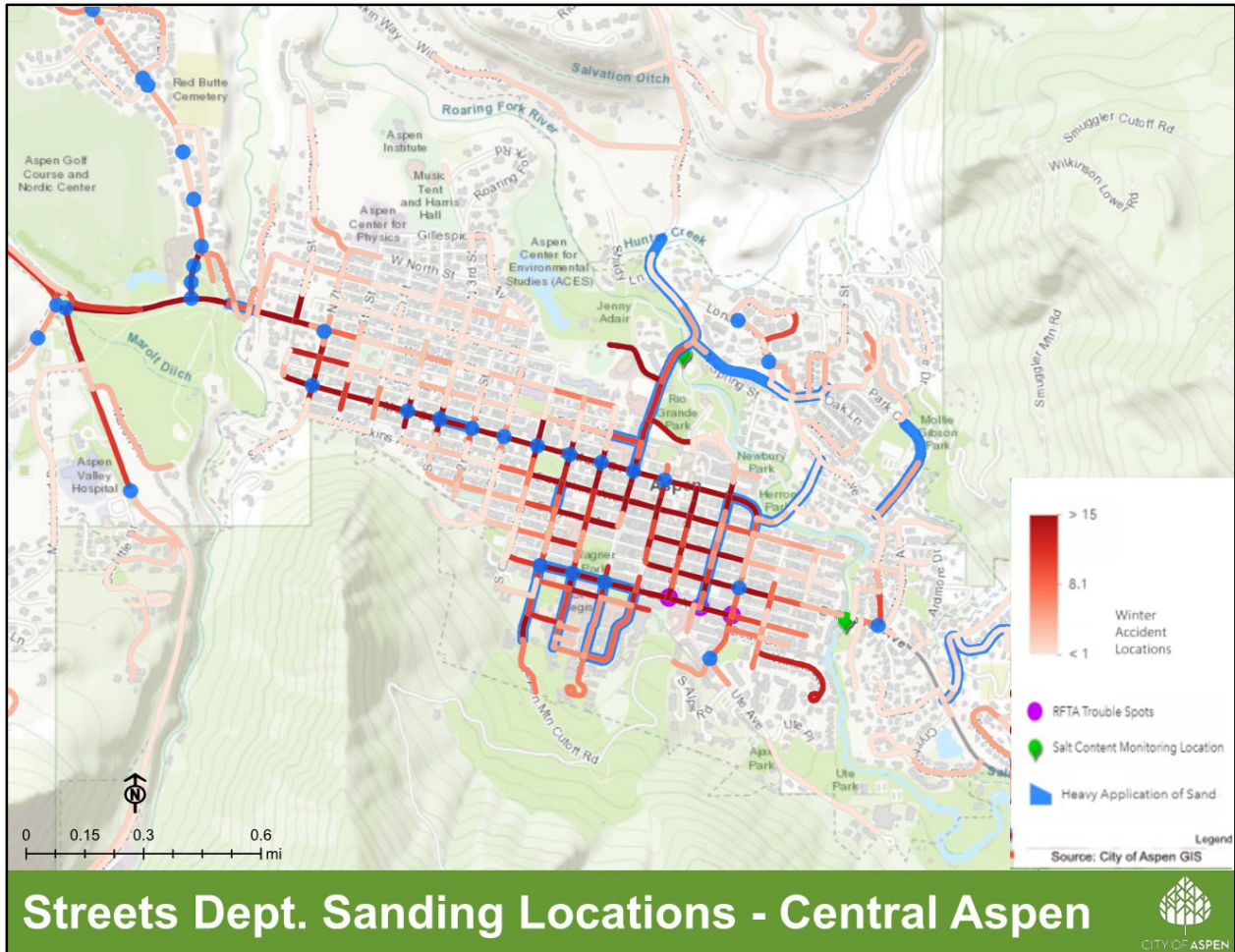


Figure 2. Variations of red indicate number of winter-time accidents, with dark red indicating more accidents. Blue dots and lines indicate areas of heavy sanding by Streets Department.

DISCUSSION:

Due to traffic accidents in recent winter seasons, requests by RFTA, and the requirement to evaluate impacts of alternative de-icers in the South Aspen Street Townhomes approval ordinance (Ordinance #38-2018.**), staff was directed to evaluate the re-introduction of chemical de-icing agents and the impact this might have on water quality in the Roaring Fork River and its tributaries.

Proposed Streets Operations -

While the application of de-icing agents is supported by the Streets Department at all intersections and streets, staff suggests a targeted application on Main Street for the 2020 season and the purposes of this limited-application test, with consideration of the high sanding request areas that have been received since the cessation of deicer chemical use in 2002.

Plan for Monitoring - While water quality monitoring has been conducted *in the River* by several reporting agencies for many years, *there has not been monitoring specific to*

analyzing the amount of sand or salt in snowmelt runoff from City outfalls in the winter. Nevertheless, there are multiple reports of **high** sediment levels in the River and reported chloride (salt) values have been consistently **below** the instream standard of 250 mg/L.***

Because there is a known impact to River water quality from sediment and because there are no known acute or chronic exceedances of chloride in this segment of the River, staff believes that exploring alternatives to “sanding” might reduce sediment loads in stormwater runoff and is therefore worth considering. Staff has researched various de-icing agents and analyzed previously taken water samples but does not have enough information to draw a conclusive picture of what the effects of de-icers are or might be on rivers in this area. Therefore, staff plans to conduct additional testing to better monitor direct impacts of de-icing agents downstream of application in a controlled monitoring plan, as follows:

1. Fall 2020 and Winter and Spring 2021 – Determine baseline water chemistry (salinity and chloride levels) using recently purchased chloride monitors installed in targeted locations (shown on Figure 1).
2. Winter 2020 – Monitor City outfalls to determine winter TSS loads and chloride levels with and without regional treatment facilities (such as Jennie Adair wetlands).
3. Winter 2020 - Conduct site-specific applications, including but not limited to those recommended by the Streets Department in Figure 1, of several different de-icing alternatives to determine concentrations in City outfalls, the Roaring Fork River, and its tributaries.
4. Spring 2021 – Estimate chemical load per application and likely dilution per impervious area to assist in estimating effects of larger future applications.
5. Spring 2021 - Estimate the Roaring Fork River’s (and applicable tributaries’) assimilative capacity (and ability to continue to meet state and/or federal clean water standards***) for chloride and sediment during winter and early spring months.
6. Early Summer 2021 – Based on the results of data collection, agent testing, anticipated environmental impacts (specifically water quality), applicable environmental standards, practicality and effectiveness (working with the Streets Dept), make recommendations for de-icing alternatives.
7. Early Summer 2021 - Work with appropriate departments (Streets, Parks, Environmental Health) and developments (South Aspen Street Townhomes, Gorsuch Haus) to propose a Winter Road Ice Management Plan (specifying when, where and how much de-icing agent(s) should be applied).
8. Summer 2021 - Prepare a Long-term Monitoring and Adaptive Management Plan to allow early identification and application alterations to prevent potential water quality impairments that are the result of the City’s winter operations and use of de-icing agents.
9. Summer 2021 - Staff will return to Council with findings from this study. If staff determines it is possible to introduce de-icing agents with minimal or negligible impacts to water quality, staff will provide a technically-based recommendation of potential de-icing agents and recommended limits for use

that does not does not adversely impact River water quality beyond State or Federal clean water standards. In that work session, staff should be able to present a rough estimate of the River's capacity for de-icing chemicals and sand, a Winter Road Ice Management Plan, and a Long-term Monitoring and Adaptive Management Plan for the Mayor and Council to consider and comment on.

Potential De-icing Agents:

There are several products and approaches to consider when using chemical de-icing agents in a winter road maintenance program. Most include one or a combination of the products described in the table below. Different approaches range from anti-icing (ice prevention by application before a snowfall event) to de-icing (application onto accumulated snow and ice) and can vary depending on locations, expected temperatures, products on hand, wet vs dry applications, etc. The table below summarizes the elements found in most products and considerations for use in Aspen.

| Product | Description | Advantages | Disadvantages | Storage and Application | Cost |
|------------------------------------|--|--|---|--|--|
| Sodium Chloride (road / rock salt) | Granular solid, can be mixed, works to 15 - 20°F | Most inexpensive, commonly used, no residue on roads | Corrosive, harmful to roadside vegetation, leaves a white residue. Additional funding in Street Department budget to purchase this chemical. Same amount of sanding material will be required for traction while we wait for this chemical to perform. | Will require a new vehicle purchase. Requires inside storage, which is not available to us at this time. | Low |
| Calcium Chloride | Liquid can be mixed, works to - 25°F | About 10-15% less needed than rock salt, works twice as fast, less corrosive | Less damaging, If too much is used it leaves wet residue, requires waterproof storage. Additional employee, additional funding in street Department budget to purchase this chemical. Same amount of sanding material will be required for traction while we wait for this chemical to perform. | Will require a new vehicle purchase. large storage tank and mixing pump purchase so this chemical can perform at lower temperatures. Requires inside storage, which is not available to us at this time. | Medium |
| Mag Chloride | liquid, can be mixed, works to - 15°F | About 10-15% less needed than rock salt, works twice as fast, less corrosive | Less damaging for vegetation, more damaging for rivers, If too much is used it leaves wet residue, requires waterproof. Additional funding in Street Department | Will require a new vehicle purchase. Requires inside storage, which is not | Low Cost: \$.80 cents to \$1.00 a gallon. |

| | | | | | |
|---------------------------------|--|--|---|--|--|
| | | | budget to purchase this chemical. Same amount of sanding material will be required for traction while we wait for this chemical to perform. | available to us at this time. | |
| Calcium Magnesium Acetate (CMA) | NOT salt (dolomitic limestone) liquidified, can be mixed, works to +20°F | Salt free, Less enviro harm, less corrosive, effect lasts longer (less application needed), much breaks bond making plowing more effective | Works slower, much more volume is needed, if too much is used it leaves wet residue, too much can affect DO in water quality. Additional funding in Street Department budget to purchase this chemical. Same amount of sanding material will be required for traction while we wait for this chemical to perform. | Will require a new vehicle purchase. Requires inside storage, which is not available to us at this time. | High (10 – 30 times rock salt) Cost: 1 ton bag runs from \$1,200.00 to \$1,600.00 per bag. |
| Beet juice | An enhancer, must be used in combo with other agent, -20°F | Helps salt stick to surface, increasing melt, dark color helps melt in sunlight, less harmful | Different enviro impacts. Requires a new vehicle purchase, additional employee, additional funding in Street Department budget to purchase this chemical. Same amount of sanding material will be required for traction while we wait for this chemical to perform. Storage space for this is not available at this time. | Will require a new vehicle purchase. Requires 2 tank storages. 1 Tank for beet juice and 1 tank storage for the other chemical that is needed to be mixed with this chemical. which is not available to us at this time. | Unsure |
| Ice Slicer | (chloride combo, granular solid | Works faster and longer, less amount needed when being applied, provides traction when it's applied. | Storage area will not be at our facility. | No storage issues with this chemical. No new vehicle purchase, additional employee or additional funding. Can be done with existing staff and equipment. | Low Cost \$14.00 more per ton than 3/8" sanding material we currently use. |

Staff has not determined a clear winner in the de-icing world – there is not a product that is effective, inexpensive, easy to store, and environmentally safe. If City Council directs staff to conduct this limited application test of de-icing agents, the Clean River Program will work with Streets Department staff, as well as utilizing the best-available

data from CDOT and the Colorado Department of Public Health and Environment, to select and test those de-icing agents that have the greatest potential for effectiveness with the least environmental impacts prior to application this winter.

FINANCIAL IMPACTS: The budget impact depends upon the de-icing agent(s) selected and costs associated with transport, storage, and application of that product. Staff will factor those considerations into the selection and work within the existing 2020 budget allocated for the Streets Department unless directed otherwise.

ENVIRONMENTAL IMPACTS: There are environmental trade-offs with regard to the implementation of deicing chemicals versus sand. In this limited and strategic application, environmental impacts would be minimal and closely monitored by staff. In this testing scenario, staff would apply an adaptive management approach, and if monitoring results indicated exceedances or near exceedances of any State or Federal water quality standards, staff would alter the chemicals and/or application to reduce impacts.

ALTERNATIVES:

RECOMMENDATIONS:

CITY MANAGER COMMENTS:

****Ordinance #38-2018, excerpt** – “The City shall evaluate the general impacts and potential effectiveness of alternative product applications that could provide increased traction on South Aspen Street such as salt-based de-icers, use of Magnesium Chloride or other similar product, increase application of sand or other similar material, or some combination of these alternatives. The City shall also evaluate the potential of resurfacing South Aspen Street with a traction base material. These evaluations shall include referral comments from the Environmental Health Department for environmental impact consideration and the Engineering Department. Included in this evaluation will be a water quality monitoring program (in coordination with the City Engineering Department subject to generally accepted engineering standards) to establish a baseline water quality level and measurement of impacts of implemented alternative maintenance strategies (including any salt-based de-icers and increased sanding impacts). Once complete, the evaluation shall be released to the Applicant and the Gorsuch Haus Project applicant.

*****Water Quality Standards** - As described in the Colorado Water Quality Control Commission's (WQCC) Regulation 33, the Roaring Fork River is assigned beneficial uses including Aquatic Life Cold-Class 1, Recreation E, Water Supply and Agriculture. When the WQCC's list of impaired waters was updated in 2012, the section of the Roaring Fork River that flows through Aspen was identified as having an impaired aquatic life use, with an unidentified cause for impairment. Many other reports dating from the early 2000s claim similar findings and list the likely cause for impairments to aquatic life as stressors associated with “urbanization”, which can include altered hydrology, decreased riparian (streambank) vegetation, and pollutants in stormwater runoff.

The WQCC does not have strict or clear guidance on sediment loads or chloride. The WQCC establishes a chloride standard of 250 mg/L average over 30-days, but that is a drinking water standard, not an aquatic life standard. As it relates to the application of sand to improve road traction, the WQCC has a statewide narrative sediment standard which states that “state surface waters shall be free from

substances attributable to human-caused point source or nonpoint source discharge in amounts, concentrations of combinations which...can settle to form bottom deposits detrimental to the beneficial uses.”

The EPA sets the chronic chloride pollution standard at 230 mg/L over a 4-day average and the acute standard at 860 mg/L. These limits are based on findings that chronic concentrations of 230 mg/L are harmful to aquatic life, while concentrations above the acute standards are lethal and sub-lethal to aquatic plants and invertebrates.

Harmful levels could look different here or in other parts of the country because of background, or naturally-occurring, levels of chloride. It is important to distinguish background levels as they can vary widely from watershed to watershed depending on geologic weathering and soils. Based on previous monitoring in the Aspen area, the average chloride level of the Roaring Fork River is 1.5 mg/L for about 50 observations in the last 10 years.

There are no state standards for sodium, magnesium, calcium, or potassium as they are natural components found in all surface water.



MEMORANDUM

TO: Mayor and City Council

FROM: April Long, P.E., Clean River Program Manager

THROUGH: Trish Aragon, P.E., City Engineer
Scott Miller, Public Works Director

MEMO DATE: August 14, 2020

MEETING DATE: August 17, 2020

RE: Council Goal #7 – Funding the Clean River Program

REQUEST OF COUNCIL: Feedback and direction regarding investigation and implementation of potential funding sources for capital projects in the Clean River Program (Council Goal #7).

SUMMARY AND BACKGROUND:

In 2005 the City of Aspen studied stormwater management and river health needs and funding options. Funding alternatives were identified and discussed by an advisory committee, which made recommendations to City Council for a dedicated property tax. In November, 2007 Aspen's voters overwhelmingly approved a special ad-valorem property tax mill levy of 0.65 mills for the specific purpose of increasing revenues to fund the City's Stormwater and Clean River Program, independent of TABOR limitation. Revenues from this tax are the main source of funding for the current program and are estimated to generate approximately \$1.2 million in 2021.

In addition to the property tax, in 2008 City Council also instituted a development fee based on impervious square footage that applied to all new and re-developments. The combination of revenues from the fee and tax were intended to fund all operating and capital costs associated with the Clean River Program (program). This fee was removed by Council in 2010 to relieve the burden on development during the recession of 2008, leaving a significant gap in funding for the program. While other fees, such as development review fees and fees-in-lieu of detention, have been established since then, they only fund a small portion of the needs of the program. Currently fees are estimated to generate approximately \$260,000 in 2021.

The primary objective of the Clean River Program for the City of Aspen is to prevent, reduce, and mitigate the impacts of urbanization on the Roaring Fork River. The 160 Fund, established and dedicated to support this effort, funds programs or projects that accomplish the following goals:

- Operate a program that is comprehensive, cohesive, and consistent year-to-year
- Protect human health, safety and property by reducing stormwater impacts and installing and maintaining the City's stormwater system
- Improve and maintain watershed functions in the Roaring Fork Valley that protect or improve the health of the Roaring Fork River in Aspen, including water quality, riparian habitat, and hydrology
- Involve stakeholders in the protection, maintenance and restoration of the Aspen watershed
- Practice stormwater management techniques that mimic natural hydrology
- Reduce the amount of pollutants that have the potential to enter the Roaring Fork River and its tributaries via stormwater runoff
- Reduce impervious surfaces so stormwater can infiltrate to remove pollutants and recharge groundwater
- Reduce the demand on the City's storm system and the cost of constructing expensive pipe systems
- Increase urban green space and areas for stormwater infiltration
- Foster positive connections between people and stormwater
- Address requirements of federal and state regulations to protect the public and restore and protect watershed health

In the 12 years since the program began, much has been done to accomplish these goals. Most notably, the completion of two regional water quality improvement projects – Rio Grande Park and Procktor Open Space (Jenny Adair Wetlands were completed prior to the establishment of the program and funding source) that, when combined, treat over 40% of City's polluted runoff; many small water quality improvements throughout town; the enlargement of Mail Trail stormwater system and other pipe replacements and repair; the development of several master plans that provide guidance for river management, mudflow hazards, system needs in the Smuggler/Hunter basin, and riparian area restoration and protection priorities.

The fund also provides for five full time employees whose work ranges from program management, long-range planning, development review, inspection and enforcement, system and parks maintenance and upkeep, monitoring, and education.

There are many outstanding projects identified in the original business plan and in more recent master plans and new projects are identified each year as more information is gained about City's existing infrastructure, threats to public safety, and the health of the river. Most recent review suggests the completion of currently identified or anticipated projects will cost in the range of 13 – 20 million (Note: This is a rough estimate and additional work should be done to better refine these numbers). Current operating costs for the program are approximately \$800,000 and transfers out of the fund are approximately \$330,000. With annual revenue estimates at \$1.5 million, that leaves

only \$370,000 each year for capital improvements. Accomplishing the backlog of projects and meeting the goals of the program would take approximately 40-50 years at that rate of funding and does very little to allow for proactive replacement of failing pipes and infrastructure.

Recognizing this funding gap, Council directed staff, through Council Goal #7, to “Identify and implement capital funding sources to address and expand the aging stormwater system as well as finance projects focused on treating outfalls to the Roaring Fork River.”

DISCUSSION:

Staff has identified a number of program funding options, with varying considerations for effectiveness and viability. Some have sufficient potential revenue capacity and are free of limitations that restrict their use or purpose. Others are more limited in application, either because they have relatively little revenue capacity or because they are restricted by legal standards or industry practice. Some revenue sources would require voter approval.

The following is a brief review potential funding sources and important aspects for Council to consider in determining if further investigation is desired.

User Fee/Utility

A stormwater user fee is similar to a water or wastewater fee – a charge is levied based on “use” of the public drainage system and some measure of discharge to it.

- This is a very popular option across the nation - more than twelve-hundred cities, counties, and districts in the United States have adopted stormwater service fees, usually as a primary funding mechanism for meeting the unfunded mandate of the EPA’s NPDES permit for municipal stormwater systems.
- Equitable approach as usually based on parameters that influence the cost of services and facilities. For example, water rates are often based on the quantity of water consumed (which influences supply source, treatment, transmission, and other costs). Stormwater rate structures are typically based on parameters such as impervious coverage, total property area, and the percentage of impervious coverage, which influence the burden (service demand) imposed on the stormwater systems and programs.
- Can be adopted by the City Council without voter approval. However, these fees have been scrutinized and legally-challenged in Colorado and across the nation as a hidden tax.
- Offers substantial revenue potential.
- Requires additional staff and operating funds to administer duties such as a monthly billing system, customer questions, etc.
- Provides easy opportunity to financially incentivize or reward stormwater management and water quality improvements on individual properties.

- Without careful crafting, it will place more burden on large impervious areas such as schools, affordable housing, and city-owned properties.
- It may difficult to explain, defend, and implement on top of the existing property tax.

Special Assessments.

A special assessment is a special district in which a charge is levied to recover the cost of special projects constructed to benefit specific properties within the district in measurable or estimable ways. The cost of a regional detention, upsized conveyance to solve a local flooding problem, or water quality control serving a limited area might be apportioned through an assessment in a similar manner.

- Costs are apportioned based on benefit rather than the cost of providing services and facilities, and assessment amounts may be ad-valorem (property value) based or structured using other parameters.
- It may difficult to explain, defend, and implement on top of the existing property tax.
- Generates appropriate revenue to accomplish specific project.
- Requires voter approval.
- Relies on recovery of costs post construction, so up-front funds must be made available.

Miscellaneous/Other Surcharges or Fees

Staff has brainstormed other fees or surcharges that have a strong nexus to stormwater management and river health that could provide some revenue.

Ideas include:

- Parking fees. Much of the City's paved (impervious) area is for the purpose of public parking. Impervious area is the direct driver for stormwater management and one of the direct drivers for water quality impairments. The City could consider an increase in parking fees to fund "green streets" or water quality improvement projects that reduce the impacts of impervious areas.
- Recreational access or use of the Roaring Fork River. Commercial rafting operations are already charged access fees along the river, and their customers indirectly benefit from improved water quality resulting from the Clean River Program.
- Water rate increase or surcharge. In some cases, stormwater fees are a flat charge or surcharge on a user's water bill and there is a loser correlation to be made on the relationship between water usage and stormwater/river system demand and impact. For instance, snowmaking and over-irrigation of lawns can result in inflated runoff events or dry-weather events that activate pollutants outside of the natural storm event.
- Development impact fee or system development fee could be charged for new development based on the incremental increase in demand and use of the system or contribution of pollutants.

- It is yet to be determined how much revenue may be generated by such fees and there could be associated collection costs that make these funding sources inefficient.

Grants

Many organizations, from the local level to the federal government, offer grants and assistance in the areas of watershed protection and water quality improvements. Several City departments have been very successful in securing grants, especially for the innovative projects the City of Aspen presents.

- Grants are offered by various organizations to State Revolving Funds, CWCB Watershed Protection, Colorado River Basin Roundtable, PitCo Healthy Rivers and Streams Board.
- Grants are a one-time allocation of funds therefore not stable or reliable.
- More likely to fund water quality, riparian, river management, green streets projects. Less likely to receive funding for infrastructure or pipes.
- Not likely to receive grants from same funding organization regularly. Therefore would need to be strategic in requests and apply to a wide variety of grant-making organizations.
- Grant application takes some staff time and administration and likely requires matching funds.
- Great for building support and partners for the program.
- Economic downturn could result in less grants/funds available in the future.

General Fund

While staff understands that the City's General Fund is already inadequate to fund all projects needed and proposed each year, it is the typical source of funding for stormwater management across the country, especially for stormwater infrastructure installation, repair, and replacement.

- Clean River capital projects could be evaluated individually against all other competing projects or Council could elect for a dedicated contribution to the 160 Fund for some term to be used without restriction or used to fund a specific type of project, such as pipe replacement.
- Less stable or reliable, as priorities shift each year during the budget review.

Property Tax Increase

Revenue from the current dedicated property tax supplies the majority of funding for the Clean River Program, at 0.65 mills and is de-Bruced from TABOR restrictions. Increasing this tax by some amount would provide additional funding from an already established source.

- Taxes are very stable and reliable, once approved.
- Requires voter approval.
- Passed by more than 60% vote in 2007, before recession of 2008.
- As indicated on the annual citizen survey, river health continues to be one of the most important issues our citizens feel the City should address.

- May see less support or prioritization fall after this year where public health, economic stability, childcare, affordable housing, and transportation rise in importance. Increased taxes generally not favored in economic downturn.
- Requires at least one-year prior to election for preparation.

Bonds

Bonding is not a revenue source but a borrowing mechanism. Through the use of bonds, funding of major capital improvements may be expedited relative to procuring funds through the annual budget process. The debt would be secured either by the general revenues of the city or by the dedicated revenue stream of the 160 fund from property taxes.

- Would incur long-term debt
- Allows for spending sooner rather than later, allowing more proactive replacement of pipes avoiding potential failures and emergency expenses.

Public Private Partnerships

Several Clean River Program projects have been completed as a partnership with private development. These are most often sought when the project, due to the natural direction and accumulation of flow, must be located on or adjacent to a private property but greatly benefits the public. These projects generally involve collaboration in design, construction, and funding by the City and the private land owner.

- Limited in scope, geography, and time. Therefore more of an opportunity that cannot be planned or relied upon.
- Not always appealing for the private entity as it requires private to front money, and City will refund after completion.
- Mutually beneficial as it typically occurs on land not owned by the City.

As is evident in the descriptions above, each potential funding source presents its own unique advantages and disadvantages in addressing the shortages faced by the Clean River Program fund. Staff is seeking feedback and direction from Council for further investigation into any and/or all of the identified potential sources to make progress towards implementation in 2021.

FINANCIAL IMPACTS: No financial impacts at this time.

ENVIRONMENTAL IMPACTS: No environmental impacts at this time.

ALTERNATIVES: None at this time.

RECOMMENDATIONS: None at this time.

CITY MANAGER COMMENTS: