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CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE 2022 SNOW AND ICE CONTROL PROGRAM
ENVIRONMENTAL STATUS AND PLANNING REPORT

PROJECT NAME	: 2022 Snow and Ice Control Program Environmental Status and Planning Report
PROJECT MUNICIPALITY	: Statewide
PROJECT WATERSHED	: Statewide
EOEA NUMBER	: 11202
PROJECT PROPONENT	: Massachusetts Department of Transportation
DATE NOTICED IN MONITOR	: March 22, 2023

As Secretary of the Executive Office of Energy and Environmental Affairs (EEA), I hereby determine that the 2022 Snow and Ice Control Single Environmental Status and Planning Report (Single ESPR) adequately and properly complies with the Massachusetts Environmental Policy Act (M.G.L. c.30 ss.61-62L) and its implementing regulations (301 CMR 11.00). This Certificate includes a Scope for the next ESPR to be filed by the Massachusetts Department of Transportation (MassDOT) in 2027.

Project Description

The purpose of the ESPR is to describe the methods and policies used by MassDOT to control snow and ice on roadways. It documents the environmental impacts of these practices and identifies the Best Management Practices (BMPs) to minimize these impacts while providing safe roadway driving conditions. The ESPR documents the environmental data, road safety requirements, and economic factors used by MassDOT to plan for and implement a Snow and Ice Control Program (SICP) with the goal of protecting sensitive resource areas, particularly

public water supplies and wetland and aquatic ecosystems. The series of ESPRs filed by MassDOT documents the historical changes and trends in the use of materials, equipment, storage practices, and snow and ice control practices, and provides an opportunity to identify and prioritize aspects of the SICP that may be improved.

The ESPR has evolved from a largely retrospective status report on snow and ice control to a broader analysis that also provides a prospective assessment of long-range plans. The ESPR provides a "big picture" analysis of the environmental impacts of current and anticipated levels of activities, and presents an overall strategy to minimize impacts. ESPR reviews are consistent with the purpose of MEPA, which requires state agencies to evaluate the environmental impacts of projects or activities requiring Agency Actions and to take all feasible measures to avoid or minimize such impacts.

History and Purpose of the ESPR

MEPA review of the MassDOT's snow and ice control procedures commenced with a series of Generic Environmental Impact Reports (GEIR) in 1978, 1995, and 2006. Revisions to the MEPA regulations in 1998 eliminated provisions for the preparation of GEIRs. In connection with the issuance of the Certificate on the GEIR in 2006, a Special Review Procedure (SRP) was established to substitute the submittal of GEIRs with ESPRs. The original SRP outlined a process where ESPRs would be prepared on a five-year cycle. Each cycle would commence with MassDOT's filing of a Draft Scope of Work (DSW) that identifies the information and analysis to be provided in a Draft ESPR (DESPR). After review of the DESPR, a Final ESPR (FESPR) would then be prepared by MassDOT to provide any necessary additional information and analysis and to address comments by Agencies, the public, and the requirements of the MEPA Certificate on the DESPR. Reflecting changes to the review process outlined in the MEPA certificate on the 2017 FESPR (issued March 2, 2018), MassDOT is now required to prepare a Single ESPR (in place of a DESPR and FESPR) for public review and comment within 18 months of the issuance of the Certificate on the DSW.

The Scope for this Single ESPR was issued as part of the Certificate on the DSW issued on March 19, 2021. This Single ESPR was previously submitted on December 27, 2022, but withdrawn to provide a response to comments submitted on the 2021 DSW and to supplement distribution to the Massachusetts Office of Coastal Zone Management (CZM), the Massachusetts Natural Heritage and Endangered Species Program (NHESP), the Massachusetts Water Resources Authority (MWRA), all regional planning agencies, and any municipality in which MassDOT conducted studies or remediation activities in relation to its snow and ice practices.

The ESPR is supplemented by Snow and Ice Control Annual Reports prepared by MassDOT that are noticed in the Environmental Monitor but not subject to a formal comment or review process. The ESPR process does not replace MEPA review of roadway projects that meet or exceed regulatory thresholds. For any project that does exceed thresholds, an Environmental Notification Form (ENF) and, if necessary, an Environmental Impact Report (EIR) would be required to analyze impacts, review alternatives, and identify measures to avoid, minimize, and mitigate impacts. The ESPR serves as a vehicle for public review of the environmental impacts associated with the SICP. The ESPR process is building a long-term data set which will provide

the opportunity to gauge the effectiveness of efforts to minimize impacts and can serve as the basis for prioritizing future planning and implementation measures.

Review of the Single ESPR

The Single ESPR was generally responsive to Scope outlined in the Certificate on the 2021 DSW. Major elements of the Single ESPR included:

- An overview of the SCIP's organization, policies, and operations, including roadway jurisdictions, historical and current use of salt, sand, and other deicing agents, materials storage and management practices, and training of employees and contractors;
- A description of new measures to build capacity to address the snow and ice removal needs on sidewalks and pedestrian facilities;
- A description of the latest equipment improvements, technologies, and BMPs used by MassDOT, including, as relevant, anti-icing and pre-wetting techniques, alternative deicers, road weather information sensor (RWIS) systems, and other BMPs;
- An update on the latest environmental protection/remediation activities and related research pertaining to environmental issues concerning snow and ice control activities, including a review of the use of the Reduced Salt Zone (RSZ) designation, a discussion of sodium data from public water supplies, a review of environmental impacts of the application of sand and deicing agents, and cost of the mitigation measures;
- Updated information on the added infrastructure costs associated with the corrosion effects from deicing chemical usage;
- An assessment of the potential economic benefits of maintaining safe travel conditions on roadways during winter weather; and
- Future considerations for additional measures to improve the Snow and Ice Control Program, such as new or improved BMPs, geofencing and other uses of global positioning systems (GPS) to track spreader activity, potential measures for avoiding storage of materials in sensitive areas, changes in deicing agent application rates, new equipment or practices that could be used in the program, and expansion or elimination of RSZs.
- A list of goals and initiatives for the SICP to be implemented over the next 5 years prior to filing of the next ESPR.
- A response to comments submitted on the 2017 FESPR and 2021 DSW.

The Single ESPR provided reformatted tables and graphs of annual road salt use expressed in tons per lane-mile and in tons per year (tpy) to allow for direct comparison of the data to previous ESPRs.

Snow and Ice Control Practices

MassDOT maintains approximately 16,120 lane miles of roadways, or 20 percent of the total lane-miles in the Commonwealth. MassDOT also maintains approximately 726 lane-miles of roadways owned by the Massachusetts Department of Conservation and Recreation (DCR). The Single ESPR reported on snow and ice control activity levels in the five-year period between

2017 and 2021. The cost of the SICP averaged $96.5 million per year between 2017 and 2021, but can fluctuate greatly (as much as 50% or more) depending on the severity of the winter weather. Plowing remains the principal means of snow removal, but is not effective during freezing rain or when ice is the primary concern. Deicing agents used by MassDOT include sodium chloride either as granular road salt or a liquid brine solution; a premix of four parts road salt and one part calcium chloride delivered as flakes or liquid; sand, usually in a 1:1 mix with road salt; and liquid magnesium chloride ($MgCL_2$). Each have been used for specific purposes and have both benefits and detriments. The Single ESPR included a table comparing the rates of application of each material between 2017 and 2021, copied below:

Fiscal Year	Liquid $MgCl_2$ (gals)	Blended Salt Brine (gals)	Pre-mix (tons)[1]	Sand (tons)
2017	1,596,890	171,796	601	15,573
2018	1,672,425	108,800	340	17,495
2019	1,712,687	56,200	858	11,948
2020	1,275,079	224,300	814	9,229
2021	1,256,778	243,065	101	12,234
Average	**1,454,859**	**117,832**	**543**	**13,296**

Notes: 1 Premix was not used in used in District 6. D5 accounts for approximately 80% of the sand use.

MassDOT typically applies road salt at a rate of 240 pounds (lbs) per lane-mile per application, which equates to approximately 0.4 lbs of salt per 100 square feet (sf). According to the Single ESPR, this application rate is considered the minimum amount necessary under most weather conditions to prevent snow and ice from freezing to the pavement. Comments from The City of Cambridge Water Department (CWD) note that this rate is high compared to the application rate guidelines published in the State of Minnesota's Snow and Ice Control Handbook (dated January 2022).[1] As described in the Single ESPR, the effectiveness of road salt dramatically declines as temperatures fall below 25ºF. In designated Reduced Salt Zones (RSZs), MassDOT uses sand with a combination of chemical deicing treatment to reduce the amount of chemical used while maintaining an acceptable level of vehicle traction. There are currently over 60 RSZs in various locations across the state; no new RSZs have been established in the past 20 years. As further discussed below, MassDOT plans to transition away from the use of sand in RSZs.

As described in the Single ESPR, MassDOT has steadily increased the use of liquid deicers (primarily blended brine) for pre-treatment of roads (also referred to as "anti-icing") and pre-wetting of road salt with liquid $MgCL_2$ since these measures were first meaningly introduced in 2011. Liquid deicers are used to pre-treat roadways and pre-wet road salt before it is applied. They help improve roadway conditions while minimizing the use of road salt. Pre-treating roadways with liquid magnesium chloride can help prevent ice from forming and delay the need to apply road salt. The Single ESPR states liquid deicers (shown as "Liquid $MgCL_2$" and

[1] Available here: http://www.mnltap.umn.edu/publications/handbooks/documents/snowice_2022.pdf

"Blended Salt Brine" in the table above) have resulted in substantial reductions in road salt usage (shown as "Pre-mix" in the table above) over the last 10 years. Specifically, annual statewide salt usage (in tons per lane-mile) has decreased by approximately 26%; since the 2017 ESPR, the average annual statewide salt usage has decreased from 26.9 to 23.0 tons per lane-mile (a reduction of approximately 14.5%). MassDOT is now using more than 75 slurry-spreaders to apply pre-wet road salt across the state, whereas less than a dozen were in use five years ago. In addition to the increased use of liquid deicers and pre-wetting of salt, new pavement sensors, flexible plow blades, tow plows, and GPS technology have been added or further integrated into the SICP (further discussed below). Comments from CWD note that the tons of salt per lane mile in MassDOT District 6 have not been reduced since the 2001-2010 timeframe.

MassDOT uses a Winter Severity Index (WSI) to help evaluate its efforts to reduce road salt usage over time under varying winter weather conditions. The WSI is calculated based on characteristics of each winter season, including daily snowfall, daily minimum and maximum temperatures and on the number of days with frost potential. It is calculated for each winter month, then averaged for a five-month period (November to March) to provide a seasonal average. The WSI is a tool to help explain how weather conditions influence MassDOT's use of road salt from year to year and provides a means of evaluating the effectiveness of upgrades in material and equipment and technological advances. During a 10-year (2001 to 2010) baseline period, trends in salt use correlate with the severity of a winter as measured by the WSI. A regression analysis of this baseline period serves to predict salt use for a given WSI. This baseline period preceded significant changes to the SICP operations, such as pre-treatment and pre-wetting. The Single ESPR provided a comparative analysis between the 2001 to 2010 baseline and the 2011 to 2022 time period. As described in the Single ESPR, salt use levels below those predicted based on the correlation between WSI and road salt application rate reflect reductions in road salt use due to improvements in SICP operations (such as pretreatment and pre-wetting), despite an increase in the number of total lane-miles maintained by MassDOT during that time. Further information regarding the normalization of WSI values should be provided in the next ESPR, as requested by CWD.

In 2019, MassDOT developed a Pedestrian Transportation Plan through an extensive stakeholder process to identify initiatives and priorities to improve pedestrian facility access and safety statewide. As described in the Single ESPR, the number of sidewalk miles and bicycle facilities has increased considerably in the last decade; currently, approximately 43% of MassDOT roadways have adjacent sidewalks (totaling 1,300 miles of sidewalks). As of the 2022/2023 winter, MassDOT plans to hire more seasonal snow and ice employees to help with sidewalk clearing. The Single ESPR states that MassDOT will continue to evaluate vendor reimbursement rates and pay codes as well, in order to enlist more contractors for sidewalk maintenance services and better reflect the variable snow removal efforts for large storms versus smaller storms. Separately, since 2021, MassDOT has provided up to $50,000 to help municipalities purchase snow removal equipment for municipally-owned pedestrian and bicycle facilities. As indicated in the Scope below, in the 2027 ESPR, the MassDOT should evaluate the success of efforts to improve safety on MassDOT pedestrian and bicycle facilities.

Environmental Protection Measures and Remediation

The Single ESPR provided an update on measures to minimize and/or remediate effects of the SICP on environmental resources, including the RSZ policy, as well as an analysis of sodium and chloride in public water supplies. RSZs are primarily located in Zone II Wellhead Protection Areas of major Public Water Supply (PWS) wells, although some are located near private wells with elevated sodium and/or chloride levels. The RSZ program is intended to reduce salt use in areas with elevated sodium levels that are likely due to SICP activities. As noted above, temperatures below 25ºF significantly decrease the effectiveness of road salt. As described in the Single ESPR, the reduced effectiveness of road salt in colder temperatures presents a significant challenge in RSZs. The Single ESPR states that personnel have found that the reduced salt applications in RSZs (through the use of salt-sand mixes) often led to more repeat applications to maintain safe roadway conditions, resulting in the total salt usage in an RSZ over the course of a season being very similar, if not more than, that used on roadways outside of RSZs. Additionally, post-season cleanup of sand along roadways requires additional labor and equipment costs.

According to the Single ESPR, the use of sand-salt mixes has not resulted in meaningful environmental benefits, and the use of sand poses environmental impacts associated with sediment and phosphorous loading in lakes and ponds. The Single ESPR states that the use of liquid deicers to pretreat roads and pre-wetting road salt has been much more effective in reducing the amount of road salt needed than using sand-salt mixes, especially at colder temperatures. As such, the Single ESPR states MassDOT is transitioning away from using sand as part of RSZ application practices and will instead focus efforts on expanding the use of other efficiency, such as pretreatment of roadways and pre-wetting salt. These measures reduce environmental impacts because the salts in the liquid deicers are less concentrated than the road salt mix (applied as solid flakes), reducing the overall concentration of salt in runoff from roadways. MassDOT additionally plans to expand the use of other efficiency measures such as slurry spreaders, as well as GPS equipment to better track salt use in these environmentally sensitive areas. Comments from DCR express concern regarding the cumulative impacts of anti-icing deicing chemicals where state highways or storage facilities are located adjacent to important water resources and other natural resources under DCR's care and control (including public water supplies), and support MassDOT's ongoing research and implementation of BMPs to minimize environmental impacts of the SICP.

Consistent with MassDEP's comments on the 2021 DSW, MassDOT analyzed the reported sodium and chloride data in PWSs located within and beyond a 0.5-mile of a MassDOT roadway, and identified the areas with the highest concentrations of sodium and/or chloride. The analyses compared the percentage of PWSs with sodium levels above MassDEP's drinking water health guideline level of 20 mg/L and the EPA health guidance level of 60 mg/L, based on reported sodium data contained in MassDEP's database through October 18, 2021. Comments from MassDEP note that the EPA's 60 mg/L guideline is only for aesthetic purposes (to avoid adverse effects on taste) and does not address health concerns regarding sodium intake. MassDEP's 20 mg/L guideline should be used as the standard for analysis. Regression analyses were also conducted to assess the relationship or correlation between PWS sodium levels and distance to a MassDOT roadway. Similar to the findings presented in the 2017 FESPR,

approximately 52% of the PWSs located within a 0.5-mile of a MassDOT road have average sodium concentrations above 20 mg/L, compared to approximately 34% of the PWSs located beyond a 0.5-mile of a MassDOT road (a difference of 18%).

As described in the Single ESPR, historically, the data suggest that sodium levels have increased over time for both PWSs that are within and beyond a 0.5-mile of a MassDOT road. However, based on data from 1991 to 1996 and that from 2017 to 2021, the percentage of PWSs located within a 0.5-mile of a MassDOT road with an average sodium concentration above 25 mg/L increased from approximately 25% to 50%, compared to an increase of approximately 10% to 25% for PWSs located beyond a 0.5-mile of a MassDOT road. Notwithstanding these discrepancies, MassDOT indicates that a regression analysis showed little statistical correlation between the sodium concentrations of PWSs and distance to a MassDOT roadways, suggesting that the difference in sodium concentrations is more likely associated with other factors, such as increased urbanization in these areas. Comments from MassDEP note that distance from MassDOT roadway does not account for the area of roadway that requires road salt application, and state that the analysis would be improved by comparing sodium and chloride levels to MassDOT Lane-Miles within the PWS drainage area. Comments from CWD similarly note that the area of MassDOT roadways within a watershed is likely a better grouping variable for analyzing sodium data than distance to roadways. MassDOT should consult with MassDEP about the appropriate analysis to accurately depict the potential effects of salt usage on surrounding water quality, and provide the results of any revised analysis in the 2027 ESPR.

Chloride in drinking water is regulated as a secondary drinking water contaminant to avoid issues with taste. MassDEP has set a secondary maximum contaminant level (SMCL) for chloride at 250 mg/L. Chloride levels above 250 mg/L may result in a salty taste but are not considered to be a direct human health risk; however, elevated chloride levels in drinking water poses an increased risk of corrosion for piping and associated connectors. Approximately 38 out of 582 PWSs that report chloride data to MassDEP have average chloride concentrations above 250 mg/L (approximately 6%). As with sodium concentrations, the Single ESPR states that a regression analysis indicated very little correlation between the chloride concentrations of PWSs and distance to a MassDOT roadways. However, as noted above, distance from MassDOT roadways is likely a less accurate grouping variable than the area of roadways within a PWS drainage area; this should be reevaluated in the 2027 ESPR. The Single ESPR identifies measures to mitigate damage from corrosion to MassDOT infrastructure.

The Salt Remediation Program provides mitigation to address elevated levels of sodium to owners of impacted wells. MassDOT conducts sampling and hydrogeological investigations to determine whether its practices are the cause of the elevated sodium levels. Mitigation measures include replacement or rehabilitation of an existing well, connecting the property to a PWS, or installation of a water treatment system. In the last five years, 76 remediation claims were filed compared to 56 claims in the previous five-year period. According to the Single ESPR, the Salt Remediation Program has successfully provided potable water supply to compliant cases using various remediation measures. Where remediation measures have not been initially successful, MassDOT continues to work with the affected homeowner or PWS to identify primary sources and potential solutions to reduce sodium concentrations. MassDOT is currently working with MassDEP, the Town of Boxborough, and representatives of the Littleton Light and Water

Department to evaluate the feasibility of extending municipal water service to an area of Boxborough where several PWSs and private wells have elevated chloride levels as well as other water quality issues. If successful, this effort would allow the residents in this area who are currently limited to water supplies impacted by chloride to utilize the Littleton Light and Water Department water supply, which does not experience the same water quality issues.

While acknowledging the success of the SICP in reducing the amount of road salt applied to roadways, comments from DCR and CWD note that sodium and chloride levels in drinking water supplies continue to increase. As described in DCR's comments, monitoring conducted by DCR throughout the Wachusett watershed has documented concerning increases in the chloride content of surface water, groundwater, and the Wachusett Reservoir itself. The Single ESPR describes watershed studies MassDOT has conducted in conjunction with municipal PWSs, including the Dedham-Westwood Water District, the Cambridge Water District, Auburn Water District, the Town of Millbury, and the Wachusett Reservoir. In addition to evaluating impacts to public water supplies, the Single ESPR also included an overview of potential effects to sensitive environmental resources, including Area of Critical Environmental Concern (ACECs) and Priority and Estimated Habitat (as designated by the NHESP). Comments from NHESP indicate that the MassDOT Snow & Ice Program has yet to meet with NHESP to develop strategies that ensure public safety while minimizing impacts to state-listed species habitat, as requested in comments from NHESP submitted on the 2006 GEIR and the 2008 DESPR. I expect MassDOT to meet with NHESP in a timely manner to discuss strategies to minimize impacts on state-listed species habitat and other ecologically sensitive areas.

The Single ESPR also reviewed the effects of climate change on SICP practices/impacts. The Single ESPR notes that climate change will likely increase corrosion of drinking water distribution pipes along the coastline through saltwater intrusion caused by sea level rise, exacerbating corrosive effects from non-point sources such as road salt. The Single ESPR also notes that milder winters in recent years have made it less enticing for contractors from a financial standpoint to commit equipment and operators to be on-call for the winter season, contributing to challenges in finding contractors for snow and ice removal. As described in the Single EIR, unique winter risks associated with climate change include more variable and unpredictable ice storms, nor'easters, heavy snow, and other severe winter conditions, presenting challenges to maintaining safe roadways. Comments from CWD note that the impact of droughts does not appear to be taken into consideration when drawing conclusions regarding impacts associated with SICP practices; specifically, cumulative sodium concentrations. As described below, more information should be provided regarding climate impacts in the 2027 ESPR.

Existing Best Management Practices for Improving Road Salt Use Efficiency

The Single ESPR described the various technologies, equipment upgrades, and policy changes adopted by MassDOT to improve the effectiveness and efficiency of the SICP while minimizing the use of road salt. As described earlier, the most effective techniques have involved the use of liquid deicers to pre-treat roadways and pre-wet road salt. Following the success of the pilot described in the 2017 ESPR, MassDOT has integrated the use of a Global Positioning System/Automatic Vehicle Locator (GPS/AVL) system, which incorporates GPS software and

equipment to set-up geo-referenced boundaries in key locations to automatically adjust or cease applications as spreader trucks travel along spreader routes.

As described in the Single ESPR, MassDOT relies on multiple sources of weather forecasting and road surface condition data to inform SICP operations. In addition to forecast information, real-time weather data as well as pavement temperature and friction (grip) data is collected from Road Weather Information Systems (RWIS). In addition to the 45 fixed RWIS previously in use, MassDOT has added 25 mobile (vehicle-mounted) RWIS sensors. I echo comments from DCR, which state that weather forecasting and RWIS information should be shared with relevant municipalities to allow these cities and towns to implement their own plowing and pre-treatment applications with more precision, potentially reducing salt applications statewide.

MassDOT recently partnered with the UMass Transportation Center to investigate how open grade friction course (OGFC) pavement might affect deicing material needs. The study involves a segment of Interstate-95 in Needham, which is a high traffic volume area. The study will compare stormwater runoff and pollutant loads from the OGFC test section to traditional hot-mix asphalt and will monitor deicing material needs and pavement conditions during winter events over a 3-year period. MassDOT also plans to add more segmented blades to its fleet, which have improved performance and typically result in less reliance on deicers than standard plow blades. The Single ESPR indicates MassDOT is contemplating revising vendor agreements to require contractors to use segmented plow blades in the future. MassDOT also plans to increase the storage capacity of slurry spreaders, and evaluate the use of pretreated salt, which is road salt already sprayed or coated with a liquid deicer.

Pilot Projects

As required by the 2021 DSW Scope, the Single ESPR reviewed past and current pilot projects and initiatives being undertaken to determine the effects of the SICP on environmental resources. MassDOT continues to expand the use of pavement friction and temperature sensors which provide real-time, road data on grip, layer thickness of water/ice/snow, road and air temperature, relative humidity, frost and dew point. These data allow MassDOT to apply snow and ice control practices in response to real-time as opposed to predicted conditions, reducing unnecessary applications of deicing materials. As noted above, MassDOT continues to expand the use of GPSD/AVL systems following the success of pilot studies. As described in the Single ESPR, AVL/GPS equipment has been piloted in key environmentally sensitive areas in Districts 1, 3, 4 and 6. Based on the success of these pilot test, MassDOT has set the goal of having all contractors equipped with AVL/GPS systems. MassDOT continues to participate in the Clear Roads Research Program to evaluate new approaches and equipment that enhance road salt use efficiency, weather forecasting and the decision-making process. MassDOT is currently participating in Peer Committee review of various research efforts through virtual workshops and meetings.

Following the 2019 Pedestrian Transportation Plan, MassDOT completed an initial pilot test of snow and ice removal operations on 35 miles of sidewalks within 33 communities. The purpose of the pilot test was to identify the resources needed (i.e., funding. staff and equipment)

to perform snow and ice operations on all sidewalks along MassDOT roads. As described in the Single EIR, MassDOT has seen a decline in the number of contractors interested in signing up to provide snow and ice removal services, and many contractors who would provide this service on sidewalks are already providing this service on roadways, and do not have the capacity to do both. As described further above, MassDOT is exploring multiple strategies to increase contractor interest, reduce reliance on contractors, and support municipalities in municipal-lead snow and ice removal.

The Single ESPR states that MassDOT recently partnered with the UMass Transportation Center to investigate how open grade friction course (OGFC) pavement might affect deicing material needs. The study involves a segment of Interstate-95 in Needham, which the Single ESPR describes as a high traffic volume area. The study will compare stormwater runoff and pollutant loads from the OGFC test section to traditional hot-mix asphalt and will monitor deicing material needs and pavement conditions during winter events over a 3-year period. The Single ESPR also states that MassDOT is evaluating pre-treated salt, which is road salt already sprayed or coated with a liquid deicer. According to the Single ESPR, an organic product or agricultural byproduct such as beet juice is often used as the liquid deicer to pretreat salt, which can result in elevated nutrients such as phosphorous and nitrogen, potentially impacting water quality as much or more than salt-based liquid deicers. MassDOT plans to gather information from suppliers and may consider initiating a pilot test where water quality data can be collected to assess the effects on receiving waters. The results of these studies (to the extent they occur) should be presented in the 2027 ESPR.

Future Initiatives

The Single ESPR listed initiatives that MassDOT intends to implement prior to filing the next ESPR. These initiatives include:

- Expanded use of slurry spreaders
- Use of segmented plow blades
- Expanded use of mobile RWIS and road condition sensors
- Expanded training resources
- Collaboration with other State Agencies to develop regional initiatives
- Advance the use of AVL/GPS on material spreaders in select locations
- Promote the use of lower application rates
- Use of pretreated salt
- Possible automation of spreaders controllers using real-time data
- Evaluation of open-graded friction coarse pavement

Scope for 2027 ESPR

The 2022 ESPR provided a comprehensive review of the SICP. It included a significant amount of data and technical analyses of road salt use, and extensive information regarding the technological and operational aspects of the program. The 2027 ESPR should update the data and analyses included in the 2022 ESPR. The DSW should identify any proposed changes to the format or organization of the ESPR. The 2027 ESPR should report on the status of the new and

ongoing initiatives identified in the ESPR and summarized herein, and include data and analyses based on their results. The 2027 ESPR should respond to this Scope, as supplemented by the Scope of the 2027 DSW to be filed at least 18 months prior to the ESPR.

As with prior ESPRs, the 2027 ESPR should include an Executive Summary summarizing the major sections of the ESPR, with supporting graphics and data tables. It should be made available as a separate document to facilitate wider distribution. The Executive Summary should be posted on MassDOT's web site. The 2022 ESPR indicates MassDOT seeks to present information in a "…more concise, bulletized format using tabular summaries and data graphs and less narrative text". The information presented in the tabular summaries and graphs should be clearly identified, and any significant outliers or trends identified and/or described. Narrative text should be provided when necessary to add clarity and/or explain any complex issues or conclusions presented in the data. The ESPR should clearly identify sections that provide new data and/or review the results of new programs and studies undertaken by MassDOT. As noted above, further information regarding the normalization of WSI values should be provided in the next ESPR.

The DSW for the 2027 ESPR should include a response to comments received on this 2022 Single ESPR. MassDOT is directed to meet with NHESP in a timely manner to develop snow & ice control BMPs when working in ecologically sensitive areas, and to develop actions or activities to remediate the documented road salt effects in these ecologically sensitive areas. MassDOT should continue to meet with MassDEP to identify opportunities for targeting the implementation of the proposed initiatives in environmentally sensitive areas and for technical assistance in developing outreach materials. The 2027 ESPR should clarify whether different practices will be implemented in RSZ's given the proposed reduction in sand use in these areas, as requested in comments from MassDEP. Salt use specifically in RSZs should be tracked separately from salt use in other areas (i.e., MassDOT Districts or watersheds) to the extent feasible. RSZs should incorporate all public water system recharge areas, as requested in comments from MassDEP. MassDOT should consider providing sodium concentration data by watershed, and should consult with MassDEP about the appropriate analysis to accurately depict the potential effects of salt usage on surrounding water quality. Data should be provided in accordance with any revised methodologies adopted with input from MassDEP. As noted above, MassDEP's 20 mg/L guideline should be used as the standard for analysis of sodium concentrations. Any public water system with sodium levels above 20 mg/l and/or chloride levels above 250 mg/l should be specifically evaluated by MassDOT to ensure that this area has been properly designated as a public water system water source recharge area and as a reduced salt zone, as stated in comments from MassDEP. Further, the public water system recharge area, as mapped by MassDEP, should be used in lieu of a half-mile radius.

Consistent with MassDOT's policy to promote alternate modes of transportation, including walking and bicycling, and implementation of its Complete Streets design program, the 2027 ESPR should provide a summary of the findings and recommendations of the Pedestrian Transportation Plan and describe any snow and ice control measures that have been implemented by MassDOT to improve pedestrian conditions. The DSW for the 2027 ESPR should identify any additional analyses or tracking of salt use associated with pedestrian facilities that will be included in the ESPR consistent with the scope and purpose of the SICP ESPRs. As requested in

comments from WalkMassachusetts, when MassDOT reports on the outcomes of the 2022 ESPR, information to evaluate the success of efforts to improve safety on MassDOT pedestrian and bicycle facilities should be provided. This information should include a map showing the location of the 1,300 miles of MassDOT sidewalks, with the sidewalks covered by work orders for clearance by MassDOT or its contractors identified; identification of sidewalk clearance responsibilities in the table showing MassDOT SICP roles and responsibilities (Table 1.2 in the 2022 ESPR); and information about the cost of sidewalk snow clearance provided by MassDOT or its contractors.

The 2027 ESPR should continue to assess the effects of climate change on its SICP, including the impacts of drought; increased occurrence and variability of ice storms, nor'easters, heavy snow, and other severe winter conditions; and saltwater intrusion. The 2027 ESPR should identify how and to what extent climate change impacts have been incorporated into SICP practices and planning. It should describe potential environmental impacts associated with any changes in SICP practices in response to climate change impacts.

ESPR Review Process

The 2027 ESPR should be submitted to MEPA for public review consistent with the requirements of the SRP. While not subject to the requirements associated with Section 58 of St. 2021, c. 8, *An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy*, and associated amendments to MEPA regulations requiring enhanced public outreach and analysis of impacts to Environmental Justice (EJ) populations, the 2027 ESPR should provide information regarding the number and characteristics of Environmental Justice populations[2] located within 1 mile of MassDOT roadways in those municipalities in which MassDOT has conducted studies or remediation activities in relation to its SICP. The 2027 ESPR should identify which drinking water sources impacted by Snow and Ice Control practices are located within or within 1 mile of EJ populations, in addition to any other requirements identified during review of the DSW. MassDOT should conduct public outreach activities to EJ populations located within 1 mile of any impacted drinking water sources to inform them of the filing of the 2027 DSW and 2027 ESPR. The 2027 ESPR should also address whether impacts from MassDOT's snow and ice control practices may results in disproportionate adverse effects on EJ populations, and how remediation efforts will specifically benefit EJ populations.

Since the filing of the 2017 FESPR, MassDOT has organized an Interagency Salt Working Group with representatives from MassDEP, DCR and MWRA to discuss potential approaches for training and to promote greater awareness of best practices, allowing opportunities for further collaboration outside of the ESPR review process. Comments from MassDEP note that the MassDEP has been actively participating in working group and looks forward to continued collaboration. Comments from CWD note that MassDOT has also recently invited CWD to participate in the working group. MassDOT should continue close consultation with the Interagency Salt Working Group to refine methodologies for data tracking and remediation efforts and to inform the 2027 DSW. As noted above, MassDOT should consult with

[2] "Environmental Justice Population" is defined in M.G.L. c. 30, § 62 under four categories: Minority, Income, English Isolation, and a combined category of Minority and Income.

NHESP to ensure that impacts to rare species are adequately addressed as part of its salt remediation efforts.

The DSW, which will be noticed in the Environmental Monitor for public review and comment, should be submitted approximately 18 months prior to the submittal of the 2027 ESPR. A Consultation Session should be held during the 30-day DSW comment period. MassDOT should consult with MassDEP, NHESP, and other agencies on the content and form of the DSW prior to its submission. Within 18 months of the issuance of the Certificate on the DSW, a Single ESPR should be submitted for public review and comment with a 30-day comment period. The filing of ESPRs will continue on a 5-year cycle.

Circulation

The 2027 DSW and ESPR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should be sent to the list of "comments received" at the end of this Certificate and to commenters on the 2021 DSW. Specifically, the 2027 DSW and ESPR should be circulated to the MEPA Electronic Distribution List,[3] including MassDEP, CZM, DCR, NHESP, MWRA, all regional planning agencies, and any municipality in which MassDOT conducted studies or remediation activities in relation to its snow and ice practices. A copy of the 2027 ESPR should be made available for public review at the State Transportation Library. The 2027 DSW and ESPR should include a copy of this Certificate and should be made available in printed or CD-ROM format upon request.

April 28, 2023
Date

Rebecca L. Tepper

Comments received:

04/14/2023	Massachusetts Department of Conservation and Recreation (DCR)
04/20/2023	City of Cambridge Water Department
04/20/2023	WalkMassachusetts (formerly WalkBoston)
04/24/2023	Massachusetts Department of Environmental Protection (MassDEP) Bureau of Water Resources
04/24/2023	Massachusetts Division of Fisheries and Wildlife (MassWildlife), Natural Heritage and Endangered Species Program (NHESP)

RLT/ELV/elv

[3] Available here: https://www.mass.gov/guides/environmental-notification-form-enf-preparation-and-filing#-filing-and-circulation-requirements-

dcr
Massachusetts

April 14, 2023

Secretary Rebecca L. Tepper
Executive Office of Energy and Environmental Affairs
Attn: Eva Vaughan, MEPA Office
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Re: EEA#11202 MassDOT Snow and Ice Control Program – ESPR

Dear Secretary Tepper:

The Department of Conservation and Recreation ("DCR" or "the Department") is pleased to submit the following comments in response to the Environmental Status and Planning Report ("ESPR") filed by MassDOT (the "Proponent") for the proposed Statewide Snow and Ice Control Program (the "Project").

The ESPR describes MassDOT tools, policies and technologies used to maintain reasonably safe travel conditions during winter weather while minimizing potential environmental impacts.

DCR and MassDOT have a strong working relationship at many levels that extends to many different projects and operations across the Commonwealth. In 2005, MassDOT began providing snow and ice control services for certain historic parkways under the care and control of DCR. Coordination between the two departments related to snow and ice control on state roadways in the Greater Boston area is ongoing. MassDOT support is invaluable to DCR, and we hope that future coordination between the departments will lead to enhanced protection and public enjoyment of the Commonwealth's resources.

DCR has concerns about the cumulative impacts of anti-icing and deicing chemicals and sand where state highways or salt storage facilities are located adjacent to important water resources and other natural resources under DCR's care and control. These include public water supplies, especially those designated as Outstanding Resource Waters (314 CMR 4.00); lakes, ponds, and rivers used for public recreation; lacustrine, riverine, and wetland ecosystems, including river and stream segments identified as cold-water fisheries (314 CMR 4.00); and in stormwater under MA General Permit MS4, Appendix H, Section 4 that identifies certain surface waters listed under the Clean Waters Act section 303(d) that includes Saw Mill Brook in West Roxbury. DCR and MassDOT expect to continue coordination of salt reduction efforts in affected watersheds. DCR supports MassDOT's ongoing research and implementation of BMPs intended to minimize environmental impacts of snow and ice control.

<u>Public Water Supply Watersheds</u>

DCR's Division of Water Supply Protection ("DWSP") manages and protects four watersheds that serve as the source drinking water supply for 3 million people. DWSP monitors water quality throughout the Wachusett watershed and has documented concerning increases in the specific conductance and chloride content of surface water, groundwater, and the Wachusett Reservoir itself.

DWSP has implemented a multifaceted program to tackle this complex issue to ultimately reduce the amount of road salt applied in the Wachusett watershed, including offering matching grants to watershed towns to encourage salt reduction efforts.

As part of the DWSP program, we have increased outreach on this issue, including to MassDOT. MassDOT staff have been a great source of information on salt related topics and potential initiatives that both agencies can work together on, including guidance for DWSP's plans to convert to using liquid salt brine for DWSP's winter operations.

Adopting the application of liquid salt brine (and other evolving liquid pretreatment technologies) has been identified as the clearest path to reducing road salt applications while still maintaining public safety. We appreciate that both DWSP and MassDOT appear to align on this important goal and recognize MassDOT for reducing its annual statewide salt usage by approximately 30%.

DWSP looks forward to exploring further reductions of salt applications with MassDOT within the watersheds DWSP protects. Particular attention to salt reduction should be focused in the three Wachusett tributaries (Gates Brook, West Boylston Brook, Scarlett Brook) where MassDEP has designated surface waters as impaired due to chloride on the 303(d) list. MassDOT's adoption of Automatic Vehicle Locator GPS technology will assist with material use tracking in sensitive areas, including major routes maintained by MassDOT within the Quabbin and Wachusett watersheds.

MassDOT's sources of weather forecasting and Road Weather Information System (RWIS) unit information should be shared with municipalities in areas where those stations are situated. This information would allow cities and towns to more precisely implement their own plowing and pre-treatment applications, resulting in reduced salt applications on a statewide level.

DWSP understands that MassDOT is considering installing a liquid brine generation facility at the Sterling depot, and DWSP wishes to express support for any MassDOT initiative that facilitates the adoption and use of brine as a pretreatment statewide.

DWSP looks forward to continuing to work collaboratively with MassDOT in the future to make additional progress in reducing the amount of road salt applied in DWSP watersheds and across the state.

<u>State Roadway Maintenance - Agency Coordination</u>

DCR's Operations Division within the Metropolitan Boston area performs snow and ice removal along 151 lane miles of parkway, including eight MassDOT vehicular bridges, and 205 miles of pedestrian routes, including 1,600 crosswalks. MassDOT performs snow and ice removal on 726 lane miles of DCR roadways. MassDOT and DCR share salt storage facilities in Nahant, Blue Hills in Milton, and Stoneham, and has brine storage in at DCR's Stoneham Operations facility.

DCR's Storm Center team works closely with the MassDOT snow and ice team before, during and after storms. During large scale snow and ice events, DCR staff are also present at the MEMA SEOC at the ESF-3 desk, while MassDOT staff operate the ESF-1 desk. Communication flows back and forth between the DCR Storm Center, ESF-3 and ESF-1 Desk through the duration of a storm. To further improve communication, DCR has dedicated 1-2 staff to the MassDOT Highway Operations Center during plowable events to help troubleshoot issues on DCR parkways as they arise.

To help coordinate operational decision making, DCR and MassDOT use Weather Sentry DTN, a private forecasting service. This service includes a 15-day forecast, detailed hourly forecasts that include current pavement temperatures and hourly pavement temperature forecasts which help determine the use of salt on the roads.

DCR's parkway fleet is now fully integrated into MassDOT's Geotab snow and ice GPS platform. This collaboration streamlines coordination of snow removal between the agencies, improves driver safety and situational awareness during storms, and captures the Commonwealth's collective snow and ice responsibilities.

Thank you for the opportunity to comment on the ESPR. DCR will continue to coordinate with MassDOT for snow and ice control on state roadways in the Metropolitan Boston area, and for implementation of BMPs statewide to reduce environmental impacts. To request additional information or coordination with DCR, please contact MEPA Review Coordinator Andy Backman at andy.backman@mass.gov.

Sincerely,

Douglas Rice

Douglas J. Rice
Commissioner

cc: Priscilla Geigis, Patrice Kish, Tom LaRosa, Nicholas Gove, Susan Hamilton, John Scannell, Jeffrey Parenti

CITY OF CAMBRIDGE
MASSACHUSETTS
Water Department
250 Fresh Pond Parkway
Cambridge, MA 02138
617 349 4770
fax 617 349 6616

April 20, 2023

Secretary Tepper
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
Eva Vaughan, EEA No. 11202
100 Cambridge Street, Suite 900
Boston MA 02114

Re: EEA #11202, MassDOT 2022 Snow and Ice Control Program, Draft Environmental Status and Planning Report

Dear Secretary Tepper,

The City of Cambridge Water Department (CWD) appreciates the opportunity to comment on the MassDOT Snow and Ice Control Program's 2022 Environmental Status and Planning Report (ESPR). Cambridge receives its drinking water from a 24 square mile surface water supply watershed located in the municipalities of Lincoln, Lexington, Waltham, and Weston. Two of the City's three reservoirs, Hobbs Brook Reservoir and Stony Brook Reservoir, are adjacent to I-95 and Route 2. Routes 2A, 20 and 117 also cross the Cambridge watershed in the east-west direction. Given the proximity of Cambridge's reservoirs to major roadways maintained by MassDOT, decisions regarding snow and ice control have a direct impact on the Cambridge drinking water supply. In recognition of this impact, MassDOT created Reduced Salt Zones (RSZs) along I-95 and Route 20 (Districts 4 and 6) to help protect the City's drinking water resources. The Hobbs Brook Reservoir and its tributaries are currently listed as chloride impaired in the 2018/2020 Massachusetts Integrated List of Waters.

Since the 2017 ESPR, MassDOT has coordinated with CWD to update a 1985 salt loading study conducted by CWD and MassDOT. This new study is still in draft form and is titled *Hobbs Brook Reservoir Sodium Chloride Water Quality Study, January 2023*. MassDOT has also recently invited CWD to participate in their Interagency Salt Working Group. CWD commends MassDOT for commissioning the UMassAmherst College of Engineering and VHB to update the 1985 salt loading study and for inviting CWD to participate in the Interagency Salt Working Group. However, more action is needed to adequately protect Cambridge's drinking water from salt pollution. As the largest single contributor of salt loads in the Cambridge drinking water supply watershed (47% according to the updated loading study, although this number is not finalized), it is imperative that MassDOT aggressively evaluate and implement strategies to further reduce the salt load. At a minimum, CWD requests that MassDOT commit to implementing the

actions recommended for MassDOT in section 9 of the January 2023 draft *Hobbs Brook Reservoir Sodium Chloride Water Quality Study:*

1. Evaluate whether the Lexington and Concord Depots have sufficient liquid deicer storage to support the expanded use of slurry spreaders and the prewetting of salt to achieve the MassDOT prewetting policy goals.
2. Closely monitor liquid usage for prewetting purposes and remind operators of the MassDOT policy goals during training sessions and as follow-up if usage is inconsistent with the goals.
3. Explore adding mobile RWIS equipment and pavement sensors particularly in the Concord Depot area to have more real-time weather and pavement condition available for District personnel.
4. Continue to expand the use of slurry-spreaders as well as newer efficiency measures in this area as funding allows and newer equipment becomes available.
5. Continue to implement new technologies and application practices as they become available and funding allows.
6. Invite a representative from CWD to meet with the Interagency Salt Working Group which includes representatives from MassDOT, MassDEP, DCR Watershed Management and MWRA [already implemented]

CWD would also like to see MassDOT lead on developing education materials and conducting trainings for municipal and private entities responsible for snow and ice in the Cambridge watershed. Additional, immediate requested actions include but are not limited to an evaluation of why the tons of salt per lane mile in District 6 (D6) have not been reduced since the 2001-2010 timeframe; evaluate the use of reduced application rates in the Cambridge watershed; provide a detailed list of best practices currently in place in the Cambridge watershed and execute a plan for implementing new strategies and technologies to reduce sodium and chloride loads.

CWD offers the following additional comments about specific sections of the draft 2022 ESPR:

1.4.2 Material Application Policy

The application rate of 240 lbs of salt per lane-mile used by MassDOT is high compared to the Application Rate Guideline in the Minnesota Snow and Ice Control Handbook for Snowplow Operators (January 2022)[1] for the 25-30 degree snow conditions (150-200 lbs/lane mile) and freezing rain conditions (180-240 lbs/lane mile). MassDOT's lower salt application rate for warmer conditions of 200 lbs/lane mile is still on the high end of the Minnesota handbook ranges. While the Minnesota guidelines say that these rates are not fixed values and should be adjusted by agencies as needed, it is not clear from the ESPR why MassDOT uses these higher rates. What data or observations has MassDOT used to reach the conclusion that the 240 lbs of salt per lane-mile is optimal for Massachusetts? Could lower application rates be considered for the Cambridge watershed RSZ?

1.4.5 Material Use Tracking in Environmentally Sensitive Areas

The ESPR explains that MassDOT plans to install "newer generation GPS/AVL units on salt spreaders used in the Dedham depot, as well as the Andover area, and the Wachusett Reservoir watershed in District 3." They will also install them for the Kampoosa Bog and in Lee. CWD requests that the use of AVL/GPS

[1] http://www.mnltap.umn.edu/publications/handbooks/documents/snowice_2022.pdf

technology also be expanded to the Cambridge watershed as well, with MassDOT facilitating and incentivizing contractors to adopt and deploy the technology.

Table 1.4 Comparison of Recent Annual Salt usage (tons per lane mile) in Each District Between FY11 and FY22 to that Previously Used in the Winter of FY01-FY10

According to this table, District 4 (D4) seems to be consistently below the statewide average tons/lane mile while D6 seems consistently above the statewide average from FY2011 through FY 2022. What accounts for this over usage in D6 and what actions could be implemented to reduce the amount of deicer used in D6?

Salt use in D6 also appears not to have improved since the 2001-2010 baseline. Footnote 3 says that the D6 baseline average use was based on D4's annual average use on a per lane-mile basis for the baseline 2001-2010 period. This explains why D6's 2001-2010 average annual usage of 34.2 tons/lane mile is essentially the same as D4 for the same time period. However, the 2011-2022 average remains largely unchanged (34.0 ton/lane mile). Why has there not been measurable improvement since the baseline period? Can improvements be implemented in D6, at least in those areas that impact the Cambridge watershed?

CWD also requests clarification on how the 2001-2010 average salt tonnage was adjusted for WSI. Footnote 2 says that the "2001-10 average annual usage was adjusted to reflect the WSI values were milder during 2011-2022 period vs. 2001 to 2010." If normalizing for WSIs, should this normalization apply to the means from both time periods?

2.1.1 Future of the Reduced Salt Zone Program and 6 Current and Future Planned Initiatives

CWD requests that MassDOT provide a description of ongoing and proposed future initiatives in the Cambridge watershed RSZ.

2.3.2 Analysis of Sodium Data in Public Water Supplies

CWD requests clarification on why the distance from MassDOT roadway was used instead of percentage of MassDOT roadway in the public water supply (PWS) watersheds to evaluate the relationship between MassDOT roads and salt concentrations. With dissolved ions like sodium and chloride that can pollute groundwater and contribute to baseflow, it is possible that concentrations are more strongly related to the area of roadway in the watershed rather than proximity of the supply to the highway.

Related, CWD requests clarification on why a half mile distance from a PWS was chosen as a grouping variable for analyzing sodium data.

2.3.3 PWSs with the Highest Sodium Concentrations and 2.4.2 Cambridge Water District

CWD agrees that MassDOT is not the only source of sodium in the Cambridge watershed, but proper context should be given to the statistic that 50% of the estimated average annual salt load was attributable to municipal roads, private roads, and parking lots. The *Hobbs Brook Reservoir Sodium Chloride Water Quality Study* (draft January 2023) notes that the load estimates from these sources could have an error of up to 50%, so MassDOT's percentile contribution could be higher or lower than reported. Also, the amount of salt load attributable to MassDOT may be revised upward to include pre-mix that may have been excluded from the original calculation. The study was also clear that the greatest increases in

groundwater salt concentrations compared to the 1985 study occurred in wells near MassDOT maintained roads. CWD looks forward to submitting additional comments on the draft report before its finalization.

CWD also has a typological correction, where the Cambridge Water District should instead read Cambridge Water Department.

2.3.4 Cumulative Frequency Distribution Curves of Reported Sodium Levels

CWD questions whether the following statement on page 37 of the ESPR can be made based on the data presented:

Again, this trend of increasing sodium levels in both PWS groups, regardless of distance to MassDOT road, suggests that the rising Na concentrations are due to multiple sources of sodium and to have a meaningful impact in reversing this trend, a more holistic approach will be required to reduce inputs from these various sodium sources.

While increases in sodium concentrations from other sources may account for some or all of the increase in concentrations, it is highly likely that drought and changes inflow and precipitation also impact concentrations, as could other factors. CWD has observed dramatic changes in salt concentrations within our water supply in response to drought conditions. There is not an acknowledgement of how sodium and chloride may build up in the groundwater from past applications of deicing chemicals by MassDOT and others in the PWS watersheds that result in higher salt concentrations due to lack of dilution during periods of drought.

2.3.5 Regression Analysis of Sodium Concentrations in PWSs and Distance to a MassDOT Roadway and 2.3.7 Reported Chloride Concentrations in PWSs

Are the data in Figures 2.4 and 2.6 mean sodium and chloride concentrations from PWSs from the 2010-2015 and 2016 – 2021 time periods (one point per PWS per regression)? If not, then the regressions risk being impacted by pseudoreplication. CWD also requests clarification on why the time periods of 2010-2015 and 2016-2021 are used to group the data in Figures 2.4 and 2.6.

CWD suggests performing regressions between the percentage of MassDOT roadway in the PWS watersheds and PWS sodium and chloride concentrations. This relationship has been found to be strong in the Cambridge watershed. In a 1997-1998 baseline study of the Cambridge watershed performed by the U.S. Geological Survey[2], the correlation coefficient for the relationship between the percent area of state-maintained roads and annual yields of sodium in tributary subcatchments was r=0.835 (which would equate to an r squared of 0.697). The r value for chloride was 0.812 (r square would equal 0.659). Even though this analysis occurred before the MassDOT FY2011 efficiency improvements, uses different data, and compares yield instead of concentration, it is a dramatic difference from the 0.026 - 0.053 r squared results from the regressions in Figure 2.4 and Figure 2.6.

[2] Waldron, M.C., and Bent, G.C., 2001, Factors affecting reservoir and stream-water quality in the Cambridge, Massachusetts, drinking-water source area and implications for source-water protection: U.S. Geological Survey Water Resources Investigations Report 00–4262, 89 p. [Also available at https://pubs.er.usgs.gov/publication/wri20004262.]

MassDOT could also perform regression analyses that compare overall impervious cover in the PWS watersheds and impervious cover from non-state owned roads in the PWS. GIS data containing the catchment areas for PWS watersheds as well as impervious cover are publicly available from the MassGIS website.

Despite the low R squared values calculated by MassDOT, it does not appear that the data presented allows for the statement on page 40 that reads:

Based on these results, it appears that Na concentrations in PWSs are as much affected, if not more so in some locations by other sources and road salt users as that related to MassDOT's SICP operations.

Weather conditions, particularly drought, may influence concentration as might the percentage of MassDOT roadway in the PWS watershed. The only conclusion that can be reached is that distance to a MassDOT roadway does not seem to be a good indicator of the PWS sodium and/or chloride concentrations.

5.3 Economic Impact on Ecosystem Services

CWD requests that the economic impact to ecosystem services acknowledge the cost of purchasing drinking water from a backup water supply or creating a secondary supply. Drinking water is an important ecosystem service that could be impacted if sodium and chloride levels become too high. In Cambridge, it could cost the City approximately 21 million dollars per year to supply drinking water from MWRA, the City's backup water supplier.

Sincerely,

Jamie O'Connell
Watershed Protection Supervisor, City of Cambridge
joconnell@cambridgema.gov
617-349-4781

walk massachusetts

April 20, 2023

Secretary Rebecca Tepper
Executive Office of Energy and Environmental Affairs

Attn via email: Eva Vaughan

Re: 2022 MassDOT Snow and Ice Control Program EEA#11202

Dear Secretary Tepper:

WalkMassachusetts (previously known as WalkBoston) commented on MassDOT's Environmental Status and Planning Report (ESPR) on Snow and Ice Control in 2018 and again in March 2021. Our 2021 comments were incorporated into the Certificate issued by EOEEA in 2021.

WalkMassachusetts has continued to follow MassDOT's efforts regarding the clearance of sidewalks, curb ramps and traffic islands that are under the agency's jurisdiction, and we are pleased that the 2022 ESPR includes several new commitments to sidewalk snow clearance.

One important step that MassDOT has taken since 2021 is the provision of grant funding of up to $50,000 to help municipalities purchase snow removal equipment for pedestrian and bicyclist facilities through its Shared Streets and Spaces Grant Program. While not directed to MassDOT owned sidewalks, this program should help to increase sidewalk snow clearance on municipal sidewalks.

As stated on page 15 of the ESPR, approximately 43% of MassDOT roads have adjacent sidewalks amounting to approximately 1,300 miles of sidewalks located mostly in the central village and downtown areas of various communities. The new steps called out by MassDOT in the ESPR (pages ES-5 and 15) are the following:

- *New for the 2022/23 winter, MassDOT plans to hire more "seasonal" snow and ice employees that report directly to MassDOT to help with sidewalk clearing as well as other activities.*
- *MassDOT will continue to evaluate vendor reimbursement rates and pay codes to enlist more contractors for sidewalk maintenance services and better reflect the variable snow removal efforts for large storms versus smaller storms.*

When MassDOT reports on the outcomes of its 2022 ESPR we ask that the following information be included so that WalkMassachusetts and others can see how successful the new efforts are at providing safe and accessible sidewalks.

1. Provide a map showing the location of the 1,300 miles of MassDOT sidewalks, and indicate which of these miles were covered by work orders for clearance by MassDOT or its contractors.
2. Include sidewalk clearance responsibilities in the table showing MassDOT SICP roles and responsibilities (Table 1.2 on page 6 of the report)
3. Provide information about the cost of sidewalk snow clearance provided by MassDOT or its contractors – similar to that provided in Table 1.9 for lane miles.

We look forward to continuing to work with MassDOT on this important public safety and mobility issue.

Best regards,

Brendan Kearney

Brendan Kearney
Deputy Director of Advocacy, WalkMassachusetts

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
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Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

April 24, 2023

Secretary Rebecca L. Tepper
Executive Office of Energy and Environmental Affairs
Attn: Eva Vaughan, MEPA Office
100 Cambridge Street, 9th Floor
Boston, MA 02114

RE: MassDOT Snow and Ice Control Program 2022 Environmental Status and Planning Report
MEPA #11202

Dear Secretary Tepper:

The Massachusetts Department of Environmental Protection (MassDEP) Bureau of Water Resources appreciates the opportunity to provide comments on the above-referenced Snow and Ice Control Program 2022 Environmental Status and Planning Report (ESPR).

This Environmental Status and Planning Report (ESPR) describes the various tools, policies and technologies used by the Massachusetts Department of Transportation (MassDOT) Snow and Ice Control Program (SICP) to maintain reasonably safe travel conditions on state roads during winter weather while minimizing the potential for environmental impacts. The SICP operates as part of the MassDOT Highway Division's Operations and Maintenance Department.

MassDEP acknowledges that ensuring the public safety of our roads during the winter months is paramount. It is also clear that protection of our public drinking waters, waterways and wetlands is vital to public health and environmental resource protection. Salt levels in our public drinking waters, surface waters, and wetlands are increasing. Salt impacts are attributable to a variety of sources (e.g., snow and ice removal on MassDOT roadways, as well as de-icing of municipal roadways and commercial/institutional/residential parking lots, wastewater discharges, and other anthropogenic sources). It is apparent that while solutions to these impacts are challenging, continued collaborative efforts between MassDOT and MassDEP, and engagement with other stakeholders, are necessary to further understand and mitigate salt impacts to the Commonwealth's water resources from roadway de-icing.

As is noted in the ESPR, in 2022, MassDOT organized an Interagency Salt Working Group with representatives from MassDEP, DCR and MWRA to discuss potential approaches for training

and to promote greater awareness of best practices. MassDEP has been actively participating in this Group and looks forward to continued collaboration.

MassDEP has the following comments on the draft ESPR:

Executive Summary:

1. According to the Executive Summary, p.4, MassDOT maintains approximately 16,120 lane miles or 20 percent of the 82,400 total estimated roadway lane miles across the state based upon the 2020 Statewide Road Inventory. The Executive Summary also notes that lane mileage has increased over the last decade when MassDOT merged with the MA Turnpike Authority adding approximately 15 percent more lane miles. Does that mean that MassDOT maintains a total of 35 percent of the total roadway lane miles in the state (MassDOT lane miles plus MA Turnpike lane miles)?

2.1 Reduced Salt Zones (RSZs) Update:

2. Chapter 2 includes a Reduced Salt Zone (RSZ) Update which notes that," MassDOT is transitioning away from using sand as part of the RSZ application practices and instead will focus their efforts on expanding the use of other efficiency measure currently being used statewide." The last paragraph reads, "MassDOT recognizes that the designated RSZs are still environmentally sensitive areas and plans to transition into a new approach by expanding the use of other efficiency measures such as slurry spreaders as well as the use of AVL/GPS equipment to better track salt use in these areas, which will allow for a more direct assessment of salt use". Please clarify whether practices, apart from the discontinuance of sand, are going to be different in the RSZs. Will state-wide practices be carried over to RSZs? Will there be tracking of salt use specifically in RSZs?

3. The document notes reduced salt zone areas in which chemicals/materials other than salt are used. These reduced salt zone areas should be mapped (similar to the Chapter 2.2 map of salt remediation cases) in GIS if they haven't been already and the data layer submitted to MassDEP so it can be overlayed and evaluated against public water systems sources and other potential sensitive areas. RSZs should incorporate all public water system recharge areas. Recharge areas for groundwater sources include the Zone II or IWPA and the Zone B for a surface water source.

4. Any chemicals or materials used in the reduced salt zones in lieu of salt should not increase the sodium or chloride levels of public water system sources in those areas. If there are non-chloride chemical options, these should be considered. The intent should be to keep sodium and chloride levels at a minimum in these areas.

2.3 Sodium Concentrations in Public Water Supplies

5. Chapter 2.3 notes MassDOT has conducted an evaluation of public water systems in the state as it pertains to sodium and chloride levels. MassDOT states it uses a sodium level of 60 mg/l based on a 2003 EPA reference document. The EPA document notes 60 mg/l

only for aesthetic reasons and does not address concerns of people on reduced sodium diets. MA has a drinking water notification level of 20 mg/l to notify people who may be on a reduced diet for health reasons. Therefore, the proper standard to use for analysis is 20 mg/l and not 60 mg/l. A public water system with levels above 20 mg/l will be required to continually notify its consumers of these levels and will typically note the source of the sodium in the notice. The ESPR also notes the secondary maximum contaminant level of 250 mg/l for chloride in drinking water. Elevated chloride levels may cause excess pipe corrosion leading to elevated levels of lead and copper in public water systems. Therefore, minimization of the use of chloride chemicals should be practiced.

6. Any public water system with sodium levels above 20 mg/l and/or chloride levels above 250 mg/l should be specifically evaluated by MassDOT to ensure that this area has been properly designated as a public water system water source recharge area and as a reduced salt zone. MassDOT uses a blanket ½ mile radius around public water system sources as the potential impact area. The public water system recharge area, as mapped by MassDEP, should be used in lieu of a ½ mile radius. All public water system recharge areas should be designated as a Reduced Salt Zones by MassDOT.

7. Section 2.3.5 presents a regression analysis of public water system (PWS) sodium (Figure 2.4) and chloride (Figure 2.6) concentrations vs. distance to a MassDOT roadway. Distance from MassDOT roadway does not account for the area of roadway that requires road salt application. The analysis would be improved by comparing PWS sodium and chloride levels to MassDOT Lane-Miles within the PWS drainage area.

2.4 Specific Watershed Studies of Salt Usage near Municipal PWS

8. Section 2.4.3. - The elevated chloride (and specific conductivity) concentrations in Dark Brook and the unnamed tributary in Auburn are well-documented, but it is unclear if definitive evidence (e.g., dry weather investigations under an Illicit Discharge Detection and Elimination Plan; e.g., video inspection) has been ascertained by Auburn to exclude illicit connections and discharges as a significant source of chloride loading to these waterways. MassDEP Watershed Planning Program continuous conductivity data from 2019-2020 for Dark Brook and the unnamed tributary show near year-round exceedances of the chronic Surface Water Quality Standard for chloride.

2.5 Potential Impacts to Surface Waters and Aquatic Resources

9. Section 2.5 - The following statement related to streams entering Wachusett Reservoir should be checked for accuracy, as it appears very surprising, “The average chloride concentrations were generally highest in streams with more urbanized watersheds and were close to 300 mg/l in watersheds with 15% to 20% impervious surface coverage.”

10. Section 2.5.1. - MassDEP chloride and continuous conductivity data collected by the Watershed Planning Program are available through 2020. The MassDEP data referenced

in the report is through 2017 only. The currency and completeness of the report could be improved by including MassDEP's Watershed Planning Program's most recent data.

11. Section 2.5.1. - The description of MassDEP's use of its chloride: specific conductance regression tool should include MassDEP's use of a 10% safety factor, which adjusts the specific conductance estimated numerical thresholds for likely exceedance of chloride standards to 3512 microsiemens per centimeter (uS/cm) and 994 uS/cm for acute and chronic chloride criteria, respectively.

12. Section 2.5.2 states that, "Although many of [chloride] impaired segments are near major travel corridors and major MassDOT roadways, as shown on these maps, these impaired segments often originate upstream of the MassDOT road in residential and commercial land use areas indicating that other road salt users or sources are contributing to these impairments. In these cases, the designated impairment is presumably due to sampling results from both upstream and downstream locations of the nearby MassDOT roadways." The conclusion that, because chloride impaired segments originate upstream of the MassDOT road, other road salt users are contributing to the impairments may be overgeneralized as Figure 2.8 for Districts 4 and 6 shows impaired streams primarily within close proximity to highways. Additional location-specific data is needed to support MassDOT's conclusion.

2.6 Potential Effects of Road Salt Use on Other Environmental Resources

13. Section 2.6.1 should discuss specific potential impacts to Areas of Critical Environmental Concern and Priority Habitat Areas based on their type and extent relative to the roadways.

2.7 Future Considerations for Environmental Resource Areas

14. Section 2.7.1. - Regarding establishment of an operator certification program with limited liability similar to New Hampshire's Green SnowPro Program, this section could be updated to note that the Interagency Salt Working Group intends to have a representative from New Hampshire's Department of Environmental Services speak to the group regarding the Program in the first half of 2023.

15. Section 2.7.1. - For public outreach, there does not appear to be definitive actions planned or being taken to educate the general public on the road salt problem, and on the costs and implications of excessive/inefficient salt use. If specific actions have been taken on general public education (e.g., instructive videos via the interagency salt working group), these should be mentioned.

16. Section 2.7.4 - MassDEP previously commented in both the draft 2022 ESPR and during the 2017 MEPA review that MassDOT should consider establishing an on-going surface water quality monitoring program which incorporates continuous data loggers for conductivity in addition to their site-specific projects.

Please feel free to contact Richard Chase of the Watershed Management Program at richard.f.chase@mass.gov, Randy Swigor of the Drinking Water Program at randy.swigor@mass.gov or Heidi Davis of the Wetlands Program at heidi.davis@mass.gov if you have any questions regarding MassDEP's comments.

Sincerely,

Kathleen M Baskin

Kathleen M. Baskin
Assistant Commissioner
Bureau of Water Resources

Ecc: MassDEP Watershed Planning Program, Richard Carey
MassDEP Drinking Water Program, Randy Swigor
MassDEP Wetlands Program, Lisa Rhodes
MassDEP Wetlands Program Highway Unit, Heidi Davis

MASSWILDLIFE

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April 24, 2023

Rebecca Tepper, Secretary
Executive Office of Environmental Affairs
Attention: Eva Vaughan**, EEA # 11202**
100 Cambridge St.
Boston, Massachusetts 02114

Project Name:	MassDOT Snow & Ice Control Program
Proponent:	Massachusetts Department of Transportation
Location:	Statewide
Document Reviewed:	MassDOT Snow & Ice Control Program 2022 Environmental Status and Planning Report
NHESP Tracking No:	06-20527

Dear Secretary Tepper:

The Natural Heritage & Endangered Species Program (NHESP) of the MA Division of Fisheries & Wildlife (the Division) has reviewed the *MassDOT Snow & Ice Control Program 2022 Environmental Status and Planning Report*, and the Division would like to offer the following comments regarding state-listed rare species and their habitats.

The Division has provided comment on MassDOT Snow and Ice Program since the 2006 GEIR. In the GEIR letter dated September 21, 2006, the NHESP stated:

"We note that several sections of the GEIR address potential impacts associated with deicing activities. Although we appreciate Massachusetts Department of Transportation addresses these issues, we find that the GEIR does not adequately convey the extent to which adverse impacts of deicing activities have been documented in the scientific literature, including some notable studies in Massachusetts. For example, on page 63, the GEIR references a study at Kampoosa Bog by Richburg et al. (2001)."

"We request that the Massachusetts Highway Department consult with the NHESP in developing Best Management Practices (BMPs) for the deicing of roads in and immediately adjacent to *Priority Habitat*. Pursuant to 321 CMR 10.05, the NHESP is prepared to work with the Massachusetts Highway Department to develop strategies that ensure public safety while minimizing impacts to state-listed species habitat. We note that it may be possible to focus such BMPs on a narrower subset of *Priority Habitats* that include areas likely to be the most sensitive to the effects of sedimentation and salinization."

On February 25, 2008, the Division provided comment to MassDOT concerning the Draft Environmental Status and Planning Report Work Plan for MassHighway's Snow and Ice Control Program.

"The Draft Environmental Status and Planning Report (ESPR) states that consultation with NHESP will occur at a later date (pages 1 & 12), therefore, the NHESP will provide comments at that time."

Please note that consultation has not yet occurred regarding the MassDOT Snow & Ice Program.

We have recently reviewed the MassDOT Snow & Ice Control Program 2022 Environmental Status and Planning Report. The Divison appreciates the recognition of the documented effects that road salt has had on the chemistry and species composition of Kampoosa Bog. In addition, the NHESP recognizes MassDOT's advancements in technology leading to reductions in salt application statewide. Please note that there are other key wetland sites in the state that have documented road salt effects, which may warrant designation as Reduced Salt Zones. These sites only represent a small subset of the documented wetlands and Priority Habitat statewide.

The Division believes that review through the MEPA process of the MassDOT Snow & Ice Control Program 2022 Environmental Status and Planning Report presents a great opportunity for MassDOT and the Division to meet to discuss the Report and to commit to developing Snow & Ice Control BMPs when working in ecologically sensitive areas (i.e. Kampoosa Bog). The Division can also work with MassDOT to develop actions or activities to remediate the documented road salt effects in these ecologically sensitive areas. Funding for these actions and activities can fall under the Salt Remediation Program. To these ends, the Division requests that any MEPA Office determination regarding the sufficiency of the Report include a condition that MassDOT meet with the Division in a timely manner for the above described purpose.

We appreciate the opportunity to comment on this Report. The Division looks forward to meeting with MassDOT to finalize our review of their Snow & Ice Control Program. If there are any questions about the Division's portion of this letter, please contact Tim McGuire, Endangered Species Review Biologist, at (508) 389-6366.

Sincerely,

Everose Schlüter

Everose Schlüter, Ph.D.
Assistant Director

cc: Massachusetts Highway Department, Environmental Services