MINUTES OF THE CENTRAL WASATCH COMMISSION ("CWC") STAKEHOLDERS COUNCIL ENVIRONMENT SYSTEM COMMITTEE MEETING HELD TUESDAY, APRIL 8, 2025, AT 3:00 P.M. THE MEETING WAS CONDUCTED BOTH IN-PERSON AND VIRTUALLY VIA ZOOM. THE ANCHOR LOCATION WAS THE CWC OFFICES LOCATED IN THE BRIGHTON BANK BUILDING, 311 SOUTH STATE STREET, SUITE, 330, SALT LAKE CITY, UTAH.

Committee Members:	Dan Zalles, Co-Chair Maura Hahnenberger Brenden Catt Ella Abelli-Amen Meaghan McKasy Doug Tolman Adam Lenkowski
Staff:	Lindsey Nielsen, Executive Director Samantha Kilpack, Director of Operations
Other:	Otto Lang, University of Utah

OPENING

1. Co-Chair Dan Zalles will Open the Public Meeting as Co-Chair of the Environment System Committee of the Central Wasatch Commission Stakeholders Council.

In the absence of Chair Kelly Boardman, Co-Chair Dan Zalles called the Central Wasatch Commission ("CWC") Stakeholders Council Environment System Committee Meeting to order at approximately 3:00 p.m. and welcomed those present. It was noted that there is a quorum.

2. Review and Approval of the Minutes from the March 11, 2025, Meeting.

MOTION: Maura Hahnenberger moved to APPROVE the March 11, 2025, Meeting Minutes. Doug Tolman seconded the motion. The motion passed with the unanimous consent of the Committee.

DUST ON SNOW RESEARCH PRESENTATION

1. Otto Lang will Present His Recent Research on Dust on Snow in the Central Wasatch.

Co-Chair Zalles welcomed Otto Lang to the Environment System Committee Meeting and explained that he would share information about his research on dust on snow in the Central Wasatch. Mr. Lang

shared presentation slides with the Committee. He is finishing his PhD at the University of Utah and his advisor is Dr. McKenzie Skiles and work is done in the Snow Hydro Lab. Mr. Lang explained the reason that dust and snow are important from a water management perspective. In the western United States, most of the precipitation occurs in the winter through spring. However, the water demand, which is driven primarily by agriculture, tends to peak in the late spring and into the late summer. This creates a supply and demand problem, as the water supply needs to be stored into the late summer months. This is done in the form of manmade reservoirs as well as a natural storage system. The latter is the mountain snowpack that holds water gradually through the snow melt period.

Snow melt is driven primarily by solar radiation that the snow itself absorbs. This is sunlight that is absorbed by the snow that warms the snowpack. When snow is clean and fresh, it reflects approximately 90% of the visible solar radiation. It is relatively difficult to melt snow when it is clean because it takes a longer period of time. When there are dust events, those particles land on the snow surface. The darkened snow can now absorb more solar energy. It will warm more and will drive earlier melt. In some cases, this can also drive a faster snow melt. There is a way to measure the reflectance of snow on a scale of 0 to 1. Values near 1 are more reflective and values near 0 are less reflective. When the snow becomes darker, there is more snow melting that will occur.

Mr. Lang shared additional information about the water supply and demand issue in the west. If there is a year with a lot of dust on snow deposition, there will be an earlier snow melt and it will shorten the snow season. There is an increased distance between the water supply and demand. That can create issues with reservoir management. Mr. Lang explained there is not a lot known about the dust on snow impacts or the historical record of dust on snow. He discussed the Great Salt Lake Basin. Three primary watersheds contribute surface water to the terminal Great Salt Lake. He mentioned the Jordan River Watershed, Weber River, and Bear River Watershed. The snowpack is susceptible to seasonal dust deposition in the spring months when dust is blowing from these west desert regions and landing on the snowpack. Mr. Lang noted that his research question is as follows:

- How does dust on snow actually impact snowmelt timing and snowmelt rates in the Great Salt Lake Basin?

Mr. Lang explained that he would walk through three different methods that have been used to answer this question. The first relates to field observations at a study site, the second uses the satellite remote sensing record to track changes in snow reflectance over time, and the third involves modeling work.

The fieldwork was conducted at Atwater Study Plot, which is in the Town of Alta. There was a full campaign over the entire snow season to find out how much dust was in the snowpack, where the dust was coming from, and how it impacts the snow melt. The dust layers were sampled and there was a measurement to determine the amount of water present in the snow. In addition, there was continuous measurement for temperature and wind speed. A snowmelt model was run to look at how the snow was melting based on the observed conditions. The model was run again with changes made to the snow reflectance so it was closer to a clean snow surface. The two model scenarios were then compared. This was done to look at the impact of how the dust can shift the snow melt timing.

Mr. Lang shared a chart that highlighted the model results. Due to the darkening impact of the dust, the snow melted approximately two to three weeks earlier at the Atwater Study Plot. This process outlined how dust on snow can influence melt at this site during that particular snow season. However, there was a desire to look at this on a broader scale as well. This was done by leveraging

the satellite remote sensing record. This results in daily snapshots of snow darkness. This information makes it possible to understand how dust influences snow melt in the Great Salt Lake Basin.

Mr. Lang shared some of the results that were averaged over the entire record. The snow melt period is defined as April through June and the averages shown are from 2001 to 2023. He explained that the averages over the Great Salt Lake Basin show that the impact of dust on snowmelt increases exponentially over the snow melt season as more dust is on the snowpack, as the layers become exposed, and as there is more sunlight later in the season. As for the differences between the three watersheds, statistically, there are similarities. It is possible to look at data specific to each year. He noted that 2009 was a high-dust year. Not only was dust deposited in large quantities, but it was exposed at the surface for a long period of time. This enabled the snowpack to absorb a lot of energy, which accelerated the snow melt fairly significantly. As snowmelt progresses and the dust layers become exposed, that drives the impact dust will have in a given year. Mr. Lang shared the full record and explained that everything above the black line represents an above-average dust impact year on the snow melt. Everything below the black line represents a below-average dust impact year on snow melt. There is no cyclical pattern and there is high variability. That being said, dust on snow is influencing snowmelt to some degree each year. It is the magnitude that varies fairly frequently.

Information about changes in snowmelt timing was shared. Mr. Lang noted that a modeling approach was taken and the focus was on the entire Great Salt Lake Basin. Everything was run over a large area, so it was not possible to rely on just one study site. The inputs to the model included data from a numerical weather prediction model. That was then run through a snow melt model and there were various outputs provided. In the end, there were approximately 17 terabytes of data that revealed a lot about snowmelt timing in the Great Salt Lake Basin and how dust impacts that. Mr. Lang shared a chart with snow depth observations for water year 2022. It is the baseline that the model results were compared to. A rose diagram was shared. The circles towards the center represent the high-elevation regions and towards the outside, there are the low-elevation regions represented. Darker purple represents where dust on snow will have the biggest impact in changing when snow will melt. It is possible to look at the patterns and hypothesize about the reason these patterns show up and how the patterns are related to dust on snow. Mr. Lang further reviewed the patterns that are shown.

There is large variability in the impact that snow darkening has on snowmelt timing based on terrain. For example, the steeper subalpine elevation slopes have a shift in snowmelt timing versus the high elevation slopes. Data from 2023 was presented. There are some similarities in the patterns. The subalpine elevations tend to have the largest shift in snowmelt timing. Snow melt is most sensitive to dust deposition there. 2023 was a snowy year and it was often cloudy. The difference in weather in any given snowmelt season can influence the patterns and the overall impact of dust on snow.

Mr. Lang reported that dust on snow influences snow melt to some degree each year. There is no robust multi-decade trend that can be used to predict future conditions at this time. It is known that there will be variations over time. It is not just the amount of dust that matters in a given season. The dust layers also have to be exposed at the surface to influence snow melt. Patterns in snowfall are important to consider as well as the seasonal meteorology over a snowmelt period. Snow melt impacts vary by terrain within a particular season. The patterns of terrain variability also vary between seasons. What was found most consistently is that the subalpine mid-elevations are generally most sensitive to snow season decline. By including the snow-darkening impact in the snowmelt models, it has been possible to predict snowmelt timing much more accurately than assuming the dust was not there. This provides a tool to predict snowmelt using the real-time observed conditions.

Co-Chair Zalles thanked Mr. Lang for his presentation about dust on snow. He imagines a lot of people in the Salt Lake Valley do not understand how important dust is to the water supply. Mr. Lang shared what was found through some of the atmospheric modeling work, which looked at where the dust comes from. The west desert contributes most of the dust, but in 2022, the modeling suggests that approximately 15% to 25% of that dust was coming from the lakebed of the Great Salt Lake itself. The Great Salt Lake is the closest dust source, so any dust that blows off of that lakebed will impact the snow melt in the Wasatch mountains. The Wasatch is vulnerable to changes in lake level.

Co-Chair Zalles asked about air pollution impacts on dust. Mr. Lang explained that in addition to dust concentration in the snowpack at Atwater, the black carbon concentrations are measured. It can be used as a rough proxy for industrial pollution. The concentrations are much lower than dust in terms of what is actually in the snowpack itself. There is some influence from pollution in the valley, but it is not significant in comparison to the dust deposition. Co-Chair Zalles noted that it is critical to maintain proper levels in the Great Salt Lake to minimize dust impacts. Mr. Lang discussed modeling for water supply forecasting. It can be more inclusive of real-time observations. In terms of reducing dust deposition onto the snowpack, the Great Salt Lake is believed to be the main factor.

Co-Chair Zalles asked if dust has a polluting impact on the water supply. Mr. Lang is not certain. Others know more about what is in the dust and how that influences the actual stream. What he has studied relates to how dust is darkening the snow and how that translates to shifts in the snow melt timing. This has implications for the ecosystem and water management strategies.

Discussions were had about collaboration and the modeling work. Mr. Lang expressed a willingness to speak to others about this matter. He has tried to share his research at as many local conferences as possible. It is important to communicate the research. Adam Lenkowski thanked Mr. Lang for his presentation. He asked whether the quantity of dust or seasonal variability is most important. Mr. Lang clarified that he has not done an analysis to determine which matters more. However, his intuition is that during the snow melt period, meteorology will likely have the predominant influence on the snow melt rates and timing. If there is a year where there is a lot of dust deposition onto the snowpack, similar to what was seen in 2009 and 2014, then that answer will likely shift. The response to the question depends on the conditions in a particular year. He pointed out that some years have more dust and some have less. In addition, there could be a snowy spring one year and not the next.

Mr. Lenkowski asked if this research is ongoing. He also wanted to know if any previous studies were looked into as part of this process. Mr. Lang reported that the record will be maintained in terms of measuring dust concentration in the snowpack, tracking dust layers, and tracking individual dust events. There are snow pits dug out and snow samples are collected every month in the winter and every week in the spring. There are a lot of people working in the lab to filter the snow samples and measure the dust. The field record is being maintained. As far as previous studies, most of the dust on snow work comes out of the Colorado River Basin. The conditions there have inspired some of this work. In terms of dust impacting snow more globally, he has looked at research papers about other locations.

Brenden Catt expressed appreciation for the information shared. He asked if there is any correlation between the position in the canyon and the concentration of dust that has been identified. He would imagine that there would be a higher concentration at the mouth of the canyon than at the study site or into the Wasatch Back. Mr. Lang explained that he did not look into this directly. Most of the

field observations were done at Atwater Study Plot for consistency purposes so there was a clear comparison between the years. However, his advisor has done this kind of work in different areas. There is some variation, but generally, there are similar dust concentrations that are found. While he is not certain, he would expect there would be a little bit less in areas like the Wasatch Back.

Co-Chair Zalles asked about the mountains in Colorado and the dust there. Mr. Lang reported that, based on the research he has looked at, the dust has to do with vegetation in desert regions as well as land disturbance. Co-Chair Zalles thanked Mr. Lang for sharing information with the Committee.

CENTRAL WASATCH DASHBOARD DISCUSSION

1. The Committee will Discuss the Central Wasatch Dashboard and Committee Priorities Based on Dashboard Data.

Co-Chair Zalles suggested looking at the Central Wasatch Dashboard in a slightly different way than it has been in the past. It is important to think about what data already exists that shows changes over time. There have been a lot of discussions about the Central Wasatch Dashboard as a resource and how the user experience can be improved, but it would be useful to call attention to some of the data that is there already. Director of Operations, Samantha Kilpack, shared the Central Wasatch Dashboard with the Environment System Committee. The Air Quality and Climate element was reviewed. Three sections were highlighted: vehicle emissions, PM 2.5 ozone, and greenhouse gases. The Utah Department of Transportation ("UDOT") vehicle traffic count information was shown. It was noted that the trends in traffic might be interesting to recreators of the canyons. These trends are not necessarily as significant when it comes to environmental concerns but could be useful for those interested in recreation within the canyons. The traffic count data was further discussed.

Co-Chair Zalles pointed out that the Air Quality and Climate element and Water element have the most change over time data. He suggested reviewing the PM 2.5 and ozone and greenhouse gases sections in the Air Quality and Climate element before reviewing the Water element. It was noted that there are still other items on the meeting agenda. As a result, an additional review of the elements will be conducted by Committee Members before the next Environment System Committee Meeting.

FOREST SERVICE NEEDS ASSESSMENT

1. The Committee will Continue Discussing Recent Forest Service Cutbacks and Resource Deficits:

- **a. Impact on Mountain Accord Implementation.**
- **b. How to Support the Forest Service.**
- **c. Collaboration with the Cottonwood Canyons Foundation.**

The Environment System Committee discussed the recent U.S. Forest Service cutbacks. Ella Abelli-Amen shared information about the Cottonwood Canyons Foundation. The foundation is waiting to see what will happen at the end of the 45-day period. The volunteer events will move forward as planned. She spoke with CWC Staff recently. There is now a date scheduled for the CWC stewardship event, which will take place on May 17, 2025. She invited all Committee Members to attend. There will be a combination of invasive weed mitigation and picnic area cleanup. That date is listed on the volunteer portal on the Cottonwood Canyons Foundation website. If Environment

System Committee Members cannot attend that event, there are other volunteer events available. The first Cottonwood Canyons Foundation event for the season will take place on Earth Day. As for additional Forest Service updates, there is still a lot of uncertainty about what will happen.

Co-Chair Zalles referenced the Federal Lands Access Program ("FLAP") grant work in Millcreek Canyon. He asked if that work was on hold. Executive Director, Lindsey Nielsen, confirmed that the project is still moving forward. It is not anticipated that there will be any problems with that work.

Doug Tolman sent an email on March 24, 2025, to the Environment System Committee. The email included a list from the local Ranger District with ways that stakeholder-associated groups are invited to assist. The Stakeholders Council and System Committees might be able to fill in some of the gaps. He feels the Environment System Committee is well-positioned to identify how different groups can provide assistance. For example, Save Our Canyons will be expanding the workdays with the Forest Service. The intention is to find more volunteers for weed pulling, trail work, and trash collection. It sounds like the Cottonwood Canyons Foundation will be assisting with staffing efforts as well.

The email was reviewed by the Committee. Mr. Tolman noted that the first component includes areas that Save Our Canyons already works in and will be expanding. It sounds like the Cottonwood Canyons Foundation will do the same. As for the middle section shown, there will be a link sent out so those interested can contact the Forest Service. He asked if there was anything on the list that a group associated with the CWC might be able to address. Co-Chair Zalles asked if there is coordination between Save Our Canyons and the Cottonwood Canyons Foundation to avoid duplicating efforts. This was confirmed. Ms. Abelli-Amen stated that there are a few joint stewardship days planned for the season. She also reported that a GoFundMe has been created for restroom maintenance.

Co-Chair Zalles expressed concerns about trail maintenance. He is not certain how frequently the trails are cleared. Ms. Abelli-Amen reported that there is normally a 10-person trail crew, but this year there will be five people on the crew. Last year, a lot of the trail crew energy was focused on rock work projects. This year, the crew will be focused largely on maintenance projects and clearing.

Co-Chair Zalles believes Save Our Canyons and the Cottonwood Canyons Foundations have a mixture of hired employees and volunteers. He asked what percentage of the work is done by the hired employees as opposed to the volunteers. Ms. Abelli-Amen reported that the Cottonwood Canyons Foundation hosts two to three stewardship events per week in the summer. That can include five to 60 people, so the events are variable, but the bulk of the work is done by paid employees. Mr. Tolman explained that with Save Our Canyons, the work is largely handled by volunteers. The email list is something that can be brought to the Stakeholders Council for consideration next week.

Mr. Tolman asked if the email list is something worth pursuing by the Environment System Committee. Ms. Kilpack noted that the list appears to be focused on recruiting and coordinating volunteers. She asked if the Forest Service would be directly working with volunteers once the volunteers were recruited. Mr. Tolman believed that a group would likely need to facilitate the first items on the list, such as Save Our Canyons, the Cottonwood Canyons Foundation, or the CWC. The individual returning volunteers section of the list would involve direct work with the Forest Service.

Additional discussions were had about the email list and what can be done to share the information with the Stakeholders Council. It was noted that it can be an informational item at the next

Stakeholders' Council Meeting. Maura Hahnenberger pointed out that the list can be broken down into different objectives. Mr. Lenkowski asked about scheduled events and whether those are related to this work. Ms. Abelli-Amen confirmed that the events are related to some of the items on the list.

Ms. Nielsen shared information about the May 17, 2025 event with the Cottonwood Canyons Foundation. She reported that there will be event details shared with Committee Members in the future. It was determined that the email list mentioned earlier will be discussed by the full Stakeholders Council at the next meeting. Mr. Tolman believed there should be some action items established. Co-Chair Zalles asked Mr. Tolman and Ms. Abelli-Amen to speak at the Stakeholders Council Meeting. Information about Save Our Canyons and the Cottonwood Canyons Foundation can be shared. In addition, there can be a discussion about some of the established action items.

LAND ACQUISITION AND CONSERVATION EASEMENT DISCUSSION

1. The Committee will Share Updates on Private Land Purchases and Conservation Easements.

Co-Chair Zalles noted that the Environment System Committee has previously discussed private lane purchases and conservation easements. Ms. Kilpack reported that at the Stakeholders Council Meeting, there will be representatives from Utah Open Lands, Summit Land Conservancy, Forest Service, and potentially someone from Salt Lake City. The intention is to have people involved in land conservation efforts speak about their work. A lot of information will be provided at that time.

LITTLE COTTONWOOD CANYON TRANSPORTATION DISCUSSION

1. The Committee will Discuss the CWC Board's 2021 Statement on the Little Cottonwood Canyon EIS, Entitled "Pillars for Transportation Solutions in the Central Wasatch".

Co-Chair Zalles reported that Chair Boardman previously expressed interest in the CWC Board statement on the UDOT Little Cottonwood Canyon Environmental Impact Statement ("EIS"). There is a desire to revisit the document that was released in 2021. It outlined the pillars for transportation solutions. At the next meeting, Chair Boardman can share comments about that document.

NEXT MEETING AGENDA

1. The Committee will Discuss Items for the Next Meeting Agenda.

The Environment System Committee will discuss the Central Wasatch Dashboard at the next meeting. Co-Chair Zalles asked Committee Members to think about data that reflects changes over time.

OTHER ITEMS

There were no additional discussions.

PUBLIC COMMENT

There were no public comments.

CLOSING

1. **Chair Boardman will Call for a Motion to Adjourn the Environment System Committee Meeting.**

MOTION: Maura Hahnenberger moved to ADJOURN the Environment System Committee Meeting. Dan Zalles seconded the motion. The motion passed with the unanimous consent of the Committee.

The Environment System Committee Meeting adjourned at 4:24 p.m.

I hereby certify that the foregoing represents a true, accurate, and complete record of the Central Wasatch Commission Stakeholders Council Environment System Committee Meeting held on Tuesday, April 8, 2025.

Teri Forbes

Teri Forbes
T Forbes Group
Minutes Secretary

Minutes Approved: _____