City of Saskatoon

PUBLIC AGENDA

SASKATOON ENVIRONMENTAL ADVISORY COMMITTEE

THURSDAY, MARCH 12, 2015, 11:30 A.M.
COMMITTEE ROOM A, SECOND FLOOR, CITY HALL

Dr. M. Hill, Chair
Ms. K. Aikens, Vice-Chair
Councillor M. Loewen
Mr. S. Homenick
Ms. A. Bugg
Ms. N. Kochar
Mr. B. Latimer
Dr. D. McGrane
Ms. A. Garg
Mr. B. Sawatzky
Dr. S. Moshiri

1. CALL TO ORDER

2. CONFIRMATION OF AGENDA

3. ADOPTION OF MINUTES

3.1 Minutes of regular meeting of the Saskatoon Environmental Advisory Committee held on February 12, 2015.

4. REPORT OF THE CHAIR (File No. 175-9)

4.1 *Verbal Update – M. Hill, Chair*

Recommendation
That the information be received.

5. SASKATCHEWAN CITIZENS' HEARINGS ON CLIMATE CHANGE (File No. CK. 375-5)

Attached for the Committee's information are documents provided by Mr. Darrin Qualman, member of the Organizing Committee of the Citizens' Hearings on Climate Change. Mr. Qualman will be in attendance to present the following:

- PowerPoint presentation - graphs reference
- A copy of presentation to Saskatoon Environmental Advisory Committee
- A list of recommendations, excerpted from Final Report of the Citizens' Hearings

Copies of the Final Report of the Citizens' Hearings on Climate Change will be circulated to the members and an electronic version is available at: https://skclimatehearings.files.wordpress.com/2014/04/saskatchewan-citizens-hearings-on-climate-change-final-report-colour.pdf.

Recommendation
That the information be received.

6. NORTHEAST SWALE MASTER PLAN - MEEWASIN VALLEY AUTHORITY (File No. CK. 4131-5)

Attached are DRAFT drawings representing both the Conceptual Design and Phasing for the Northeast Swale Master Plan, as presented by the Meewasin Valley Authority. Mr. Alan Otterbein will be in attendance to present to the Committee.

Recommendation
That the information be received.

7. REPORTS FROM ADMINISTRATION

7.1 Environmental and Corporate Initiatives Update (File No. CK. 7550-1)
Verbal Update – B. Wallace

Recommendation
That the information be received.

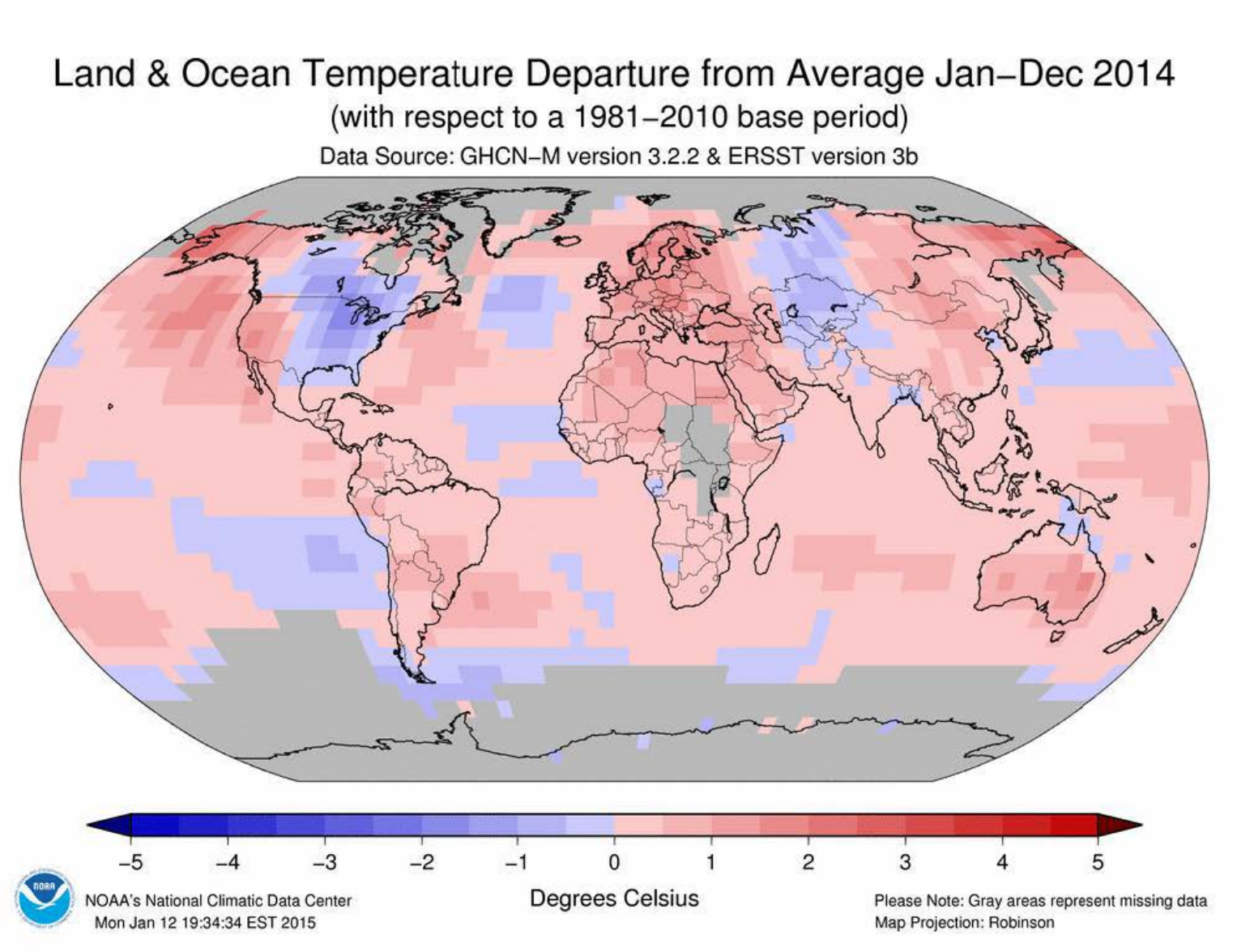
8. STATEMENT OF EXPENDITURES (File No. CK. 1704-5)

Attached is a current Statement of Expenditures.

Recommendation
That the information be received.

9. ADJOURNMENT

We cannot assess climate change on the basis of our local experience. It is global experience that needs to be tracked.



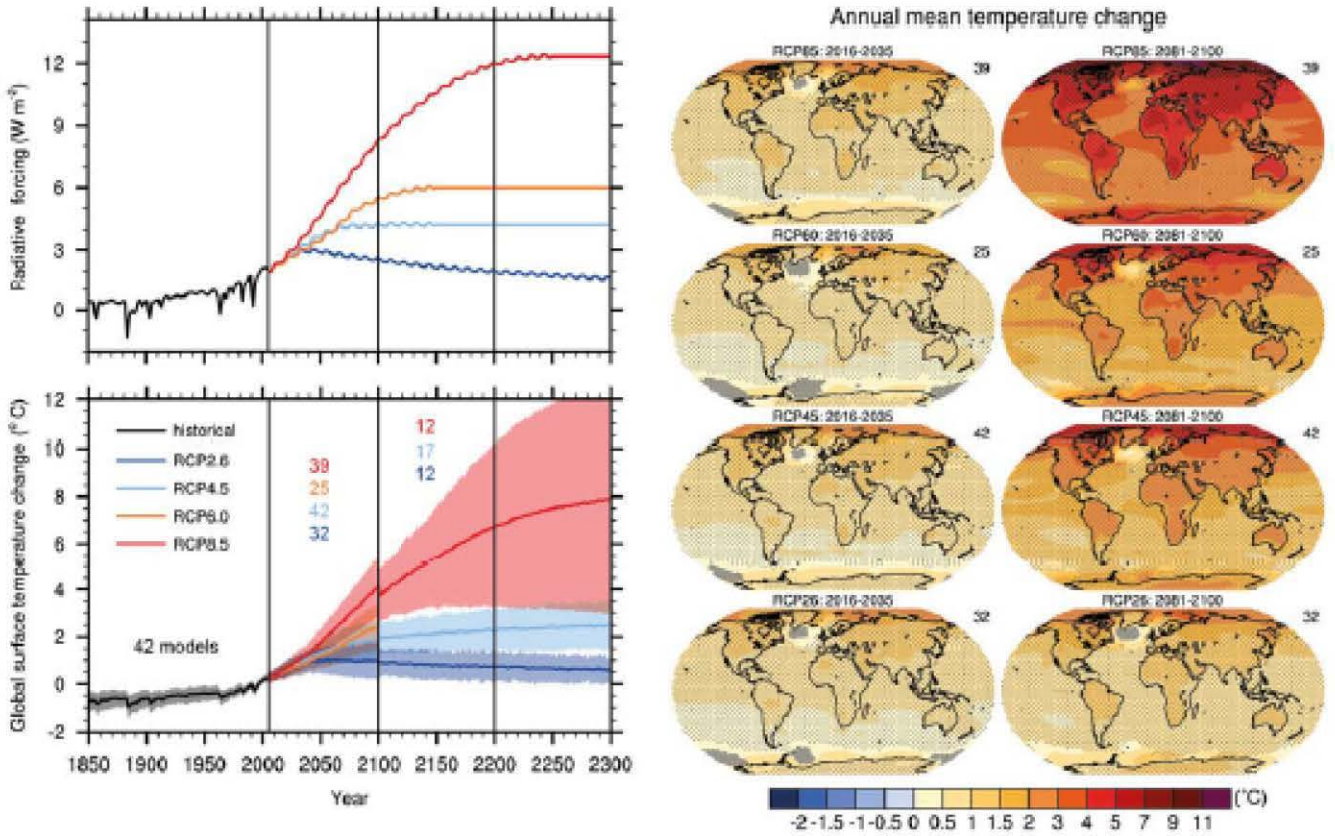


Figure TS.15: Top left: Total global mean radiative forcing for the 4 RCP scenarios based on the MAGICC energy balance model. Note that the actual forcing simulated by the CMIP5 models differs slightly between models. Bottom left: Time series of global annual mean surface air temperature anomalies (relative to 1986–2005) from CMIP5 concentration-driven experiments. Projections are shown for each RCP for the multimodel mean (solid lines) and ±1.64 standard deviation (5–95%) across the distribution of individual models (shading). Those ranges are interpreted as "*likely*" changes at the end of the 21st century. Discontinuities at 2100 are due to different numbers of models performing the extension runs beyond the 21st century and have no physical meaning. Numbers in the same colours as the lines indicate the number of different models contributing to the different time periods. Maps: Multimodel ensemble average of annual mean surface air temperature change (compared to 1986–2005 base period) for 2016–2035 and 2081–2100, for RCP2.6, 4.5, 6.0 and 8.5. Hatching indicates regions where the multi model mean signal is less than one standard deviation of internal variability. Stippling indicates regions where the multi model mean signal is greater than two standard deviations of internal variability and where 90% of the models agree on the sign of change. The number of CMIP5 models used is indicated in the upper right corner of each panel. {Box 12.1; Figures 12.4, 12.5, 12.11; Annex I}

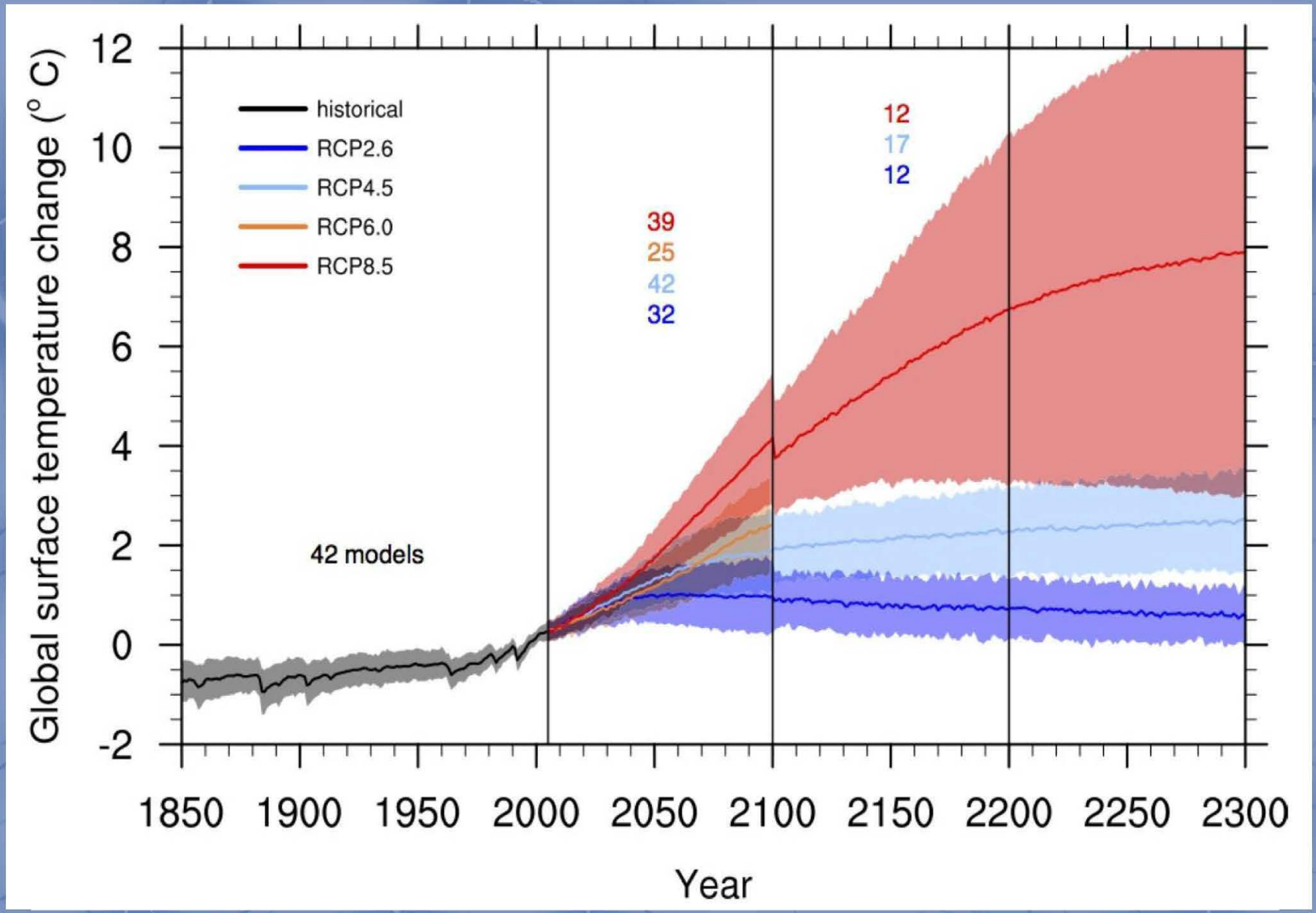

Global surface temperature change (° C)
12
10
8
6
4
2
0
-2
historical
RCP2.6
RCP4.5
RCP6.0
RCP8.5
42 models
39
25
42
32
12
17
12
1850
1900
1950
2000
2050
2100
2150
2200
2250
2300
Year

Table 6.12: The range of compatible fossil fuel emissions (PgC) simulated by the CMIP5 models for the historical period and the 4 RCP scenarios, expressed as cumulative fossil fuel emission. In order to be consistent with Table 6.1 budgets are calculated up to 2011 for historical and 2012–2100 for future scenarios, and values are rounded to the nearest 5 PgC.

	Compatible Fossil Fuel Emissions Diagnosed from *Concentration-Driven* CMIP5 Simulations			Land Carbon Changes			Ocean Carbon Changes		
	Historical / RCP Scenario	CMIP5 ESM Mean	CMIP5 ESM Range	Historical / RCP Scenario	CMIP5 ESM Mean	CMIP5 ESM Range	Historical / RCP Scenario	CMIP5 ESM Mean	CMIP5 ESM Range
1850–2011	365 [a]	350	235–455	5 ± 40 [b]	10	–125–160	140 ± 25 [b]	140	110–220
RCP2.6	275	270	140–410	[c]	65	–50–195	[c]	150	105–185
RCP4.5	735	780	595–1005		230	55–450		250	185–400
RCP6.0	1165	1060	840–1250		200	–80–370		295	265–335
RCP8.5	1855	1685	1415–1910		180	–165–500		400	320–635

Notes:

(a) Historical estimates of fossil fuel are as prescribed to all CMIP5 ESM models in the *emissions-driven* simulations (Andres et al., 2011).

(b) Estimate of historical net land and ocean carbon uptake from Table 6.1 but over the shorter 1850–2011 time period.

(c) IAM breakdown of future carbon changes by land and ocean are not available.

IPCC estimate for the global budget:

990 billion tonnes CO_2

March 12, 2015 Presentation to the City of Saskatoon Environmental Advisory Council from the Citizen Hearings on Climate Change Organizing Committee

1. Brief Update on New Developments Since The Citizen Hearings on Climate Change Report Was Published

The Saskatchewan Citizen Hearings on Climate Change report was published in early 2014 on the basis of evidence presented at two full days of public hearings in Saskatoon in November 2013. Since that time a few notable events have occurred which merit a short update.

Firstly, the calendar year 2014 had the highest global average temperature ever recorded since temperature record keeping began. Notably, Saskatchewan's experience of 2014 (with an exceptionally long, cold winter) is not at all in keeping with the global experience. (slide 1) When it comes to climate change, it is global trends that are critical, and building local public awareness of these trends is essential to our long term well-being.

Second, Saskatchewan's cooler than average 2014 did not mean that climate change impacts were not being experienced. A good example is the intense rainfall events that struck southeast Saskatchewan in 2011 and again in 2014. Many Saskatchewan communities have now experienced 2 so-called "one in a 100 year rainfall events" in just 3 years, a reflection of the fact that climate change is altering the hydrological cycle in dangerous ways. As a result, spending on Provincial Disaster Assistance is skyrocketing. In fiscal year 2014 it will be approximately $150 million.

Third, the Intergovernmental Panel on Climate Change (IPCC) 2014 reports concluded that wheat and maize yields are in decline in the global aggregate, and clearly attribute that decline to manmade greenhouse gas emissions. IPCC warned government leaders in 2014 that among other impacts, failure to reduce manmade greenhouse gas emissions quickly will lead to a reduction in reliable global food supplies, and a decline in water supplies in many dry areas of the world. It will also result in a very significant increase in extreme weather events. Saskatoon public policy needs to take account of the overwhelming evidence in this regard.

Fourth, European countries are setting their greenhouse gas reduction targets in preparation for the climate change negotiations in Paris in December 2015. The European Union is already well on its way to achieving its 2020 emissions reduction target of a 20% cut in greenhouse gas emissions relative to 1990 levels. It is now making plans for achieving a 40% reduction below 1990 emission levels by 2030. Last week Switzerland became the first country to officially file its emission reduction plans with the United Nations in preparation for Paris - a 50% reduction below 1990 emission levels by 2030. Meanwhile, Saskatchewan is currently more than 75% above our 1990 emission levels. Our record is so embarrassing that we have stopped using the internationally recognized baseline of 1990 as our baseline. Our current provincial target is a 20% reduction below 2006 emission levels by 2020. No progress whatsoever has been made since that target was set in 2009.

2. The Implications of A Global Carbon Budget for Saskatchewan

The IPCC technical report which came out in November 2013 identified 4 emissions pathways which the world could take, depending on how seriously we pursue greenhouse gas mitigation measures:

slide 2– shows the implications of each pathway for radiative forcing and for temperature change

It has been agreed internationally by pretty well everyone that we need to keep global mean temperature from rising by more than 2degC. Looking at that bottom-left graph more closely...

slide 3

...we see only one of the emissions pathways has a reasonable chance of delivering reliably on that target – RCP2.6.

So what does that mean in terms of global emissions?

New integrated models have enabled climate researchers to identify the global carbon emissions budget which we need to stay within in order to hit any given temperature target with any reasonable probability of success- and because CO2 has such a long residence time in the atmosphere, that's a budget not just for a few years but effectively for all time. And here is the number which the IPCC came out with.

slide 4 – point to relevant number (270 Pg C)

Converted to tonnes of carbon dioxide, that is equivalent to...

slide 5

... 990 billion tonnes CO2 total – which, incidentally, means leaving about 2/3 of established and claimed fossil fuel reserves (and a much higher proportion of total fossil fuel resources) in the ground.

How do our emissions targets and our emissions performance relate to that?

If we were to divide up that carbon dioxide emissions budget equally per capita worldwide, Saskatchewan's share would be 153 million tonnes, which at our present emissions rate of 45 million tonnes annually, would take less than 4 years to release. While Saskatchewan clearly can't avoid exceeding that threshold by a substantial amount, this analysis illustrates that the time is long overdue for Saskatoon and Saskatchewan to move decisively in making very deep emission cuts as quickly as possible. A scientifically-realistic emissions target is thus far more ambitious than any policy measures now on the table.

3. Suggested Corporate Emissions Reductions in Saskatoon:

We commend the City of Saskatoon for the policy measures that have been implemented to reduce "corporate energy use". The new proposal for a 35% reduction from 2013 to 2020 is a positive step forward, but insufficient. Thus, moderate modifications to current practice will no longer be enough.

At present, we are not sufficiently aware of the detail of corporate emissions to be able to offer you a comprehensive plan. However, **we consider it imperative that the city develop**

such a plan – otherwise targets will not be met. We offer the following suggestions, working from the categories in the City Council's 2014 Environmental Leadership Report (page 12):

Buildings – reductions of more than 35%, if prioritized, should be quite achievable through extensive retrofits to building envelopes, waste reduction strategies and introduction of renewable energy at a serious level. We suggest all new City buildings feature net-zero energy construction.

Vehicles – The City should begin a conversion to super energy-efficient vehicles and electric vehicles charged by renewable power sources. Idling of city-owned vehicles should be prohibited, unless there are safety reasons for doing so.

Streetlights – considerable savings are possible here. Richard Huziak presented convincingly to the Citizens' Hearings, on the basis of years of research, and we would urge the Council to follow his advice – ensure no light is lost upwards, generate no more light than is needed for safety, use the most efficient options for the location, etc. We commend the City for moving to LED lighting in the Evergreen neighbourhood and urge a similar conversion in all City neighbourhoods.

Water and sewage – we are interested in the reason for the spectacularly large rise in emissions in this sector from 1990 to 2013. The largest savings here could be achieved by reducing the volume of flow required – there is substantial international experience in doing this.

Corporate waste – clearly reducing the volume of waste should be the first priority.

4. Suggested Community Emission Reduction Strategies in Saskatoon

Corporate emissions are dwarfed by those of our community at large, and especially the industrial sector. We would therefore like to see a concerted effort to encourage very deep reductions in community emissions, a matter that we acknowledge is challenging because while under City administration influence, it is beyond City Council and administration's direct control.

Substantial **residential and commercial** emissions reductions are possible through building retrofit programmes. To enable this, we suggest that the city re-examine the option of Local Improvement Charges (as now used in a number of municipalities in Ontario), and either determine a means of applying them which is compliant with the Cities Act or lobby for that Act to be amended.

The potential for improvement is even greater with **new buildings**, most of which are at present constructed to energy standards which would be unacceptable in most of northern Europe. It is not difficult to construct to higher standards: to ensure this would require a city energy efficiency code. [In Canada, new home construction in all Ontario communities has moved to Energy Star. In the city of Freiburg, Germany, all developments on land purchased from the city are required to meet the Passivhaus standard – a much more rigorous and much lower-consumption standard than Energy Star or R-2000. Buildings that follow the Passivhaus standard can much more readily become net zero energy buildings.]

As new neighbourhoods are developed in Saskatoon, we urge that **subdivision design** be modified so as to maximize sunlight exposure. All new homes should be equipped with solar

hot water and designed and wired for future installation of solar photovoltaic systems. New subdivision designs should also make provision for future installation of a light rail system.

Saskatoon has attempted significant and commendable steps towards **renewable power generation**. We are delighted with the work done to develop the Landfill Gas Generating Station, as well as the City's planned solar initiative at that site. However, renewable energy generation in Saskatoon needs to be accelerated. In this context, we urge the City to revisit the Solar City Pilot Programme that was under consideration a few months ago, with the view to approving funding.

The fact that the City of Saskatoon has its own municipal utility is an enormous advantage in the struggle to rein in greenhouse gas emissions from power generation. It has the potential to allow the City of Saskatoon to set its own policy path in support of clean, renewable sources of electricity. Saskatoon has many potential policy options it could pursue using its municipal power utility. First, it could promote net metering – a policy in which it would pay Saskatoon residents the same rate for renewable electricity as those customers now pay for buying electricity from Saskatoon Light and Power. (SaskPower has had a net metering policy in place since September 2007.) Second, it could promote feed-in-tariffs, a policy to incent renewable energy installations that has now been adopted by more than 70 countries worldwide. Under a feed-in-tariff policy customers who install renewable electricity facilities receive a price for the electricity they produce that reflects actual installation costs for the renewable energy technology they have installed. (Banff, Alberta has a feed-in-tariff policy at the municipal level. Third, the City could negotiate with SaskPower for the right to develop wind power facilities within a given distance of Saskatoon (for example, 50 kilometres) These could either be constructed by a community-wind farm project or by Saskatoon Light and Power. A fourth option would be the construction of solar power plants in all newly planned Saskatoon neighbourhoods, and wherever suitable space is available in existing neighbourhoods. The City of Saskatoon could formally ask SaskPower for permission to allow Saskatoon Light and Power to undertake solar power plant installations in new Saskatoon neighbourhoods, given that these neighbourhoods lie outside of the SLP district, and given that SaskPower shows no indication of pursuing solar installations.

We would like to see Saskatoon move forward with a **district heating** initiative. Utilization of waste heat from the QE Power Station has long been discussed. There is also potential for more biomass utilization. For example, we understand that trimmings and prunings from the city's trees are sent to the landfill. It would be worth examining whether these could instead be burnt to provide district heating in a Saskatoon neighbourhood, and possibly also electricity.

It is disturbing that the per capita emissions from **transportation** are actually rising. Climate change is only one reason why we need to encourage people to spend less time in their cars and trucks. An efficient, more comprehensive, more frequent public transit system, where necessary on dedicated bus lanes, and using modern high-efficiency vehicles, should be central to city planning. Likewise, we need a comprehensive system of cycle lanes, with built-in safety features for cyclists where they need to cross major traffic routes. In addition, we urge the City to consider incentives for motorists to purchase super-energy efficient vehicles. Perhaps the operators of these vehicles could be eligible for free one hour parking privileges. Finally, we encourage the City to prohibit vehicle idling during the spring, summer and fall months. (Special exceptions to the policy would receive consideration.)

Community waste simply needs to be reduced – Council should consider charging a fee per bin emptied to every address which also has recycling available.

That leaves the largest sector – **industry**. Given that the vast majority of industry receives its energy from corporations over which the city has no control, it is also the most difficult sector. However, we suggest that the city explore options for tax incentives for major energy efficiency initiatives. We also recommend that Saskatoon Light and Power be mandated by Council to negotiate with large industrial facilities on a schedule for energy efficiency improvements. Moreover, we recommend the City adopt strict standards for space heating and electrical efficiency in all newly constructed industrial facilities.

It is important to have public support for proposed renewable energy initiatives at the municipal level, and that requires an educated public Here we share our thoughts about public education initiatives the City of Saskatoon might want to consider. We think it is critical that Saskatoon residents develop an understanding of how long the greenhouse gases they emit each day will remain in the atmosphere. This is fundamental to understanding why these manmade emissions must be eliminated entirely within 50 years (or much sooner if deep emission cuts are not implemented quickly across the globe). We think it is also critical that residents be kept aware of progress being made on the emissions reduction front – somewhat like what United Way does with its annual billboard campaign.

The recommendations we have made here today are our observations about best places to start in reducing city-wide emissions. As these are implemented, planning will need to begin quickly for an even deeper set of emission reductions. It is essential that a comprehensive plan be developed to achieve Saskatoon's greenhouse gas reduction target

We hope these suggestions are useful for your deliberations. Our sincere thanks for the opportunity to make this presentation to you.

A list of recommendations, excerpted from Final Report of the Citizens' Hearings

Conclusions and Recommendations of the Commissioners

Putting it into context

1. The problems of climate change are primarily caused by the greenhouse gas emissions associated with fossil fuel consumption here and around the world. Coal and then oil are the worst greenhouse gas emitters, but there are also substantial emissions associated with burning natural gas. In addition, there are secondary but important sources of human-produced greenhouse gas emissions, and these are particularly relevant in a Saskatchewan context. Examples include: methane and carbon dioxide emissions from fossil fuel extraction, carbon dioxide emissions from deforestation (including the burning of bush and shelterbelts), nitrous oxide emissions from the application of nitrogen fertilizer, and methane emissions from landfills and intensive livestock operations.

2. It is very clear that climate change resulting from human-produced greenhouse gas emissions poses grave risks to the well-being of peoples around the world, as well as to other species. These risks include: severe heat waves, severe flooding in many regions, disruption of the hydrological cycle, unstoppable sea level rise, declines in food production in many regions, serious water shortages in many regions, spread of disease, intensification of wild fires, widespread loss of coral reefs, degradation of ecosystems, extinction of many species, more powerful hurricanes/typhoons, and acidification of the oceans. Portions of our planet are at risk of becoming uninhabitable. The World Health Organization estimates that 150,000 people already die from climate change each year, and if human-produced greenhouse gas emissions are not phased out, this number is certain to rise sharply in the decades ahead. Moreover, there is likely to be large scale migration involving tens of millions of people, as some parts of the world become more and more difficult to live in. Several of the above-mentioned risks are already in the early stages of becoming reality.

3. The dilemma we have gotten ourselves into as a global society is that, once emitted, carbon dioxide and nitrous oxide last an exceptionally long time in our atmosphere – 100 years (average) and 114 years respectively. This is why human-produced emissions have built up to dangerous levels more quickly than many citizens expected. As a result, catastrophic effects from their growing atmospheric concentration can only be avoided by completely phasing out human-produced emissions of these greenhouse gases. In other words, fossil fuel use must be phased out worldwide and replaced with clean renewable energy sources.

4. For our population size, Saskatchewan and Alberta are the worst greenhouse gas polluters in Canada and among the very worst in the world. With only 3% of Canada's population, Saskatchewan accounts for 10% of Canada's greenhouse gas emissions.

5. Climate change is a moral issue that requires a moral response. Without concrete action, critical life support systems will suffer irreparable damage. In our judgment, damaging the planet for the sake of cheap fossil fuel energy is wrong.

6. The negative impacts of climate change are not equally experienced, but are disproportionately felt by those in developing countries, as well as more locally, by Indigenous communities. Those living in poverty, the elderly, and the ill are more likely to be affected by climate change and associated health impacts. Put another way, climate change is a violation of basic justice. The countries most responsible for producing greenhouse gas pollution (like Canada) are for the most part not the countries expected to suffer the gravest consequences of climate change.

7. To date, when it comes to climate change and fossil fuel policy, governments in Saskatchewan, Canada and many other parts of the world appear to be prioritizing short term economic gain over social and environmental health. Given the emerging climate crisis, this is a dangerous strategy.

Saskatchewan: Impacts and Responsibilities

8. With respect to climate change impacts locally, Saskatchewan residents should be particularly worried about the disruption of the hydrological cycle that is now occurring. There has already been a marked increase in flooding in our province over the past decade, and that is likely to continue for some time. Saskatchewan also needs to be concerned about the growing potential for more intense and prolonged drought, a risk likely to become a reality as the century progresses. Third, Saskatchewan is vulnerable to the potential for more extreme weather events.

9. Saskatchewan and all parts of the globe have a moral responsibility to communities most affected by climate change; and to our children, grandchildren, and all future generations to act quickly to reduce greenhouse gas pollution. We also have a special responsibility to other species to protect them from climate change. If stabilization of greenhouse gas concentrations in the atmosphere cannot be achieved soon, the economic, social and environmental costs for the next generation will be very high.

Government Leadership and Support

10. Climate change cannot be addressed without the full cooperation and leadership of local, provincial, First Nations, Métis, and national governments. Citizens urgently need their elected representatives at each level of government to work together to establish good climate policy that achieves atmospheric stabilization of greenhouse gases and protects the future of human society and of the other species we share the Earth with. Equally important, the citizens of Saskatchewan need to give their support to the enactment of sound climate policies. That will inevitably involve some inconvenience, but many exciting new opportunities as well.

11. Saskatchewan's government has made no headway over the past decade in reducing total province-wide greenhouse gas emissions. There is no justification for such inaction, given the urgency of climate change and the fact that the Province has many policy levers at its disposal.

Similarly, although worthwhile emission reduction projects are being undertaken at a municipal government level, there is no evidence to suggest that any progress has been made in actually reducing total city-wide greenhouse gas emissions in Saskatoon. The same can likely be said for other large centres across Saskatchewan.

12. Despite the overwhelming scientific evidence that greenhouse gas emission reduction is imperative, national leadership on climate change has been noticeably absent, and is best symbolized by the Government of Canada's withdrawal from the Kyoto Protocol. Kyoto continues to be the only formal climate change treaty among industrialized countries with firm emission reduction obligations, and Canada's withdrawal came despite the fact that the treaty is having a positive effect.

Positive Steps Forward

13. The Citizens' Hearings decided to give special attention to how climate change is influencing the global hydrological cycle, given that these changes appear to be having a major influence in Saskatchewan, Alberta and Manitoba. We were fortunate to have Bob Sanford address this topic. Bob is the Director of the Western Watersheds Research Collaborative and EPCOR Chair of the Canadian Partnership Initiative in support of the United Nations "Water for Life" Decade. He noted that hydrologists have been reporting observed changes in the rate and manner in which water moves through the global hydrological cycle for at least a decade. Concern has grown to the point that in 2013 the World Economic Forum ranked the global hydro-climatic crisis 4th out of 50 top global risks of concern, and 2nd in terms of its potential to impact not just the performance, but the survival, of businesses in many sectors of the global economy.

14. At the local level there are exciting opportunities that municipal governments should pursue to promote energy conservation in buildings, reduce the use of fossil fuels in transportation, and encourage nature to thrive in our communities. This involves a broad range of policy measures such as facilitating the installation of high efficiency lighting, providing alternative energy options for residences and businesses, promoting vehicle sharing and carpooling, and designing a city-wide bicycle path network that provides a real alternative to fossil-fuel based transport. Natural areas – which are important absorbers of carbon dioxide (carbon sinks) should be protected as new subdivisions are planned, and those subdivision plans should include super-energy efficient homes and good solar access for property owners. This report elaborates extensively on the opportunities that exist.

15. At a provincial level there are some obvious places to start cutting emissions that will make a big difference. For example, if the Saskatchewan government required the oil industry in our province to consistently capture and utilize natural gas/methane, instead of venting and flaring it into the atmosphere, millions of tonnes of greenhouse gas emissions would be saved each year. Similarly, if Saskatchewan's aging coal fired power plants were replaced with a broad mix of renewable sources of electricity over the next decade, millions more tonnes of emissions would be saved annually. Those two actions alone would cut Saskatchewan greenhouse gas pollution by approximately one third.

16. Saskatchewan is fortunate to have a remarkable mix of renewable sources of energy that we are only just beginning to utilize. Saskatchewan has the best sunlight resource in Canada, a wonderful wind resource, modest geothermal potential and excellent opportunities for developing biomass. Accelerating the development of these renewable energy resources should be a priority for local, provincial and national governments. So too should promoting energy efficiency in all economic sectors and in all walks of life.

17. The economics of large scale wind power are particularly attractive. There is no reason why Saskatchewan could not integrate far more wind power onto its electricity grid, and encourage the development of wind-farm cooperatives as a way to reduce greenhouse gas emissions and keep profits from wind power circulating in the local community.

18. We note that feed-in-tariffs to accelerate the use of renewable energy technologies such as solar, biomass and geothermal are being used in more than 60 countries worldwide. We encourage the adoption of feed-in-tariffs in Saskatchewan's electricity generation sector.

19. Canada and Saskatchewan should recognize that a world that faces the imperative of phasing out fossil fuels is a world that does not need new large scale fossil fuel extraction assets to be constructed. It is time, for example, for our national government to stop approving the development of new oil sands extraction facilities in Alberta, and for Saskatchewan to drop the idea of developing oil sands in this province. The oil sands sector is currently the fastest growing source of greenhouse gas emissions in our country. It is also time to terminate all subsidies designed to encourage the extraction of fossil fuels, here in Canada and around the world.

20. The Government of Canada should rejoin the Kyoto Protocol, and adopt a national action plan for greenhouse gas emission reduction similar to that of Europe. Most European countries are meeting ambitious greenhouse gas reduction targets, and the European Union is on track to achieve a 20% reduction below 1990 greenhouse gas emission levels by 2020. Canada needs to catch up. The world community is relying on us to do our share.

Concluding Comments

21. Climate change will impact the livelihoods of a great many who rely on the land for their income. This is one of the reasons why greenhouse gas emissions must be curbed quickly. If prompt action is not taken, climate change will lead to loss of habitable land, species loss, increased poverty and climate-related illness and loss of life.

22. In order to fully understand the need to take action on climate change and what to do, we need to remain connected to nature and we must grow in our understanding of how nature sustains us, and how we can best protect it. Simply put, we need to have a relationship with the land. Many witnesses at the hearings addressed the importance of public education in this arena, and the need for a plan to build "sustained awareness" of climate change impacts among all citizens.

23. It is critical that people are fully engaged in the climate change issue. It should become a priority for our school systems, for our Universities and Colleges, and in community education. The future depends on it.

24. We need to build on the wisdom of our Aboriginal ancestors and our living elders at this time of crisis.

25. Enforcement of treaties between the Government of Canada and First Nations may prove to be an important vehicle to secure better protection of the natural environment. An excellent area where this could be tested in court is on First Nations lands that are being negatively impacted by oil sands development. Indigenous communities and social movements have already called the Government of Canada to account for changes to federal legislation, without prior and informed consent of First Nations, which reduce protection of waterways and facilitate further development of oil sands infrastructure.

26. It is important to emphasize that it is the total amount of human-produced greenhouse gas emissions in the atmosphere that will ultimately shape the climate. In other words, every individual, every province and every country's emissions matter. The urgent task of each jurisdiction should be to bring their total greenhouse gas emissions down; failure to do so becomes a burden for everyone else worldwide. Several other parts of the world are successfully reducing greenhouse gas emissions. In Canada the Province of Ontario has provided important leadership in emission reduction by introducing feed in tariffs to promote renewable energy and by phasing out its coal fired power plants.

27. This report contains many excellent examples of personal action that can be taken and of government policies that could be put in place at a local and provincial level to reduce greenhouse gas emissions. We urge readers to examine them closely, and implement them broadly. It is important to remember that we should not wait for national and international

DRAFT - Conceptual Design

Northeast Swale Master Plan
October 29, 2014

Contour interval: 0.5 m
Scale: 1:7500

0 50 100 200 300m

2013 Aerial Imagery Courtesy of City of Saskatoon

N

Meewasin

Northeast Swale DRAFT Drawings

CITY LIMITS
PERIMETER HIGHWAY
SMALL SWALE
COMMUTER PARKWAY
CENTRAL AVENUE
UNIVERSITY HEIGHTS 3
MOOSEWOODS-BATOCHE TRAIL
SOUTH SASKATCHEWAN RIVER
DRY POND
SWMF
LOWE ROAD
FEDORUK DRIVE
ASPEN RIDGE
MCORMOND DRIVE
EVERGREEN
SILVERSPRING
PETURRSON'S RAVINE
U OF S RECLAMATION LANDS
CROCUS PRAIRIE
SASKATOON NATURAL GRASSLANDS
FORESTRY FARM PARK & ZOO
DRAINAGE FEATURE

Key

- Vehicular Road
- Greenway: includes Shared-use Path
- Internal Secondary Trail
- Internal Primary Trail
- Internal Tertiary Trail
- Boardwalk
- External Trail Connections: proposed
- External Trail Connections: existing
- Greenway / Primary Trail Access
- Parking Area: range of sizes
- Major Node: seating, map, waste receptacles
- Minor Node: seating
- Picnic area
- Interpretive Node: sign/viewpoint/seating
- Facility: washrooms, education, recreation
- Resource Management Access
- Washroom Facilities
- Fencing: Access Control Fencing (TBD)
- Fencing: Wildlife Friendly Fencing
- Stormwater Works

Interpretive Nodes

A - Limestone Quarries
B - Moose Woods-Batoche Trail
C - Stormwater Management
D - Wetland Restoration
E - Resource Management
F - Grassland Ecology
G - Rubbing Stone / Pinned Rock
H - Hydrology
I - Geomorphology
J - Grassland Ecology
K - Wetland Ecology
L - Riparian Ecology

DRAFT - Phase 1

Meewasin Northeast Swale Master Plan
January 2015

Contour interval: 0.5 m
Scale: 1:7500
0 50 100 200 300m

2013 Aerial Imagery Courtesy of City of Saskatoon

N

Meewasin

CITY LIMITS
CITY LIMITS
CITY LIMITS
PERIMETER HIGHWAY
PERIMETER HIGHWAY
SMALL SWALE
COMMUTER PARKWAY
CENTRAL AVENUE
SOUTH SASKATCHEWAN RIVER
UNIVERSITY HEIGHTS 3
MOOSEWOODS-BATOCHE TRAIL
SWMF
LOWE ROAD
DRY POND
WET POND
FEDORUK DRIVE
FEDORUK DRIVE
ASPEN RIDGE
MCORMOND DRIVE
EVERGREEN
DRAINAGE FEATURE
PETURRSON'S RAVINE
U OF S RECLAMATION LANDS
SILVERSPRING
CROCUS PRAIRIE
SASKATOON NATURAL GRASSLANDS
FORESTRY FARM PARK & ZOO
CENTRAL AVENUE

Interpretive Nodes

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C - Stormwater Management
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F - Grassland Ecology
G - Rubbing Stone / Pinned Rock
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I - Geomorphology
J - Grassland Ecology
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Key

- Vehicular Road
- Greenway: includes Shared-use Path
- Internal Secondary Trail
- Internal Primary Trail
- Internal Tertiary Trail
- Boardwalk
- External Trail Connections: proposed
- External Trail Connections: existing
- Greenway / Primary Trail Access
- Parking Area: range of sizes
- Major Node: seating, map, waste receptacles
- Minor Node: seating
- Picnic area
- Interpretive Node: sign/viewpoint/seating
- Facility: washrooms, education, recreation
- Resource Management Access
- Washroom Facilities
- Fencing: Access Control Fencing (TBD)
- Fencing: Wildlife Friendly Fencing
- Stormwater Works

DRAFT - Phase 2

Meewasin Northeast Swale Master Plan
January 2015

Contour interval: 0.5 m
Scale: 1:7500

0 50 100 200 300m

2013 Aerial Imagery Courtesy of City of Saskatoon

Meewasin

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PERIMETER HIGHWAY
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FORESTRY FARM PARK & ZOO
CENTRAL AVENUE
DRAINAGE FEATURE

Interpretive Nodes

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I - Geomorphology
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Key

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- Internal Primary Trail
- Internal Tertiary Trail
- Boardwalk
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- External Trail Connections: existing
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DRAFT - Phase 3

Meewasin Northeast Swale Master Plan
January 2015

Contour interval: 0.5 m
Scale: 1:7500

0 50 100 200 300m

2013 Aerial Imagery Courtesy of City of Saskatoon

Meewasin

N

CITY LIMITS
CITY LIMITS
CITY LIMITS

PERIMETER HIGHWAY
PERIMETER HIGHWAY
COMMUTER PARKWAY
SMALL SWALE
CENTRAL AVENUE
CENTRAL AVENUE
SOUTH SASKATCHEWAN RIVER

UNIVERSITY HEIGHTS 3
MOOSEWOODS-BATOCHE TRAIL
ASPEN RIDGE
DRAINAGE FEATURE
SWMF
SWMF
DRY POND
LOWE ROAD
FEDORUK DRIVE
FEDORUK DRIVE
MCORMOND DRIVE
EVERGREEN
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SILVERSPRING
U OF S RECLAMATION LANDS
CROCUS PRAIRIE
SASKATOON NATURAL GRASSLANDS
FORESTRY FARM PARK & ZOO

Key

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DRAFT - Phase 4

Meewasin Northeast Swale Master Plan
January 2015

Contour interval: 0.5 m
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0 50 100 200 300m

2013 Aerial Imagery Courtesy of City of Saskatoon

Meewasin

N

CITY LIMITS

CITY LIMITS

CITY LIMITS

PERIMETER HIGHWAY

PERIMETER HIGHWAY

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COMMUTER PARKWAY

CENTRAL AVENUE

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UNIVERSITY HEIGHTS 3

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SWMF

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FEDORUK DRIVE

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SILVERSPRING

U OF S RECLAMATION LANDS

CROCUS PRAIRIE

SASKATOON NATURAL GRASSLANDS

FORESTRY FARM PARK & ZOO

CENTRAL AVENUE

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Key

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- Fencing: Access Control Fencing (TBD)
- Fencing: Wildlife Friendly Fencing
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DRAFT - Phase 5

Meewasin Northeast Swale Master Plan
January 2015

Contour interval: 0.5 m
Scale: 1:7500

0 50 100 200 300m

2013 Aerial Imagery Courtesy of City of Saskatoon

Meewasin

N

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CENTRAL AVENUE
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ASPEN RIDGE
DRAINAGE FEATURE
SWMF
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- Washroom Facilities
- Fencing: Access Control Fencing (TBD)
- Fencing: Wildlife Friendly Fencing
- Stormwater Works

CK-1704-5

01-5536-103 ENVIRONMENTAL ADVISORY COMMITTEE (2015)

DATE	NUMBER	DESCRIPTION	Total Committee Expenses			
			DEBIT	CREDIT		G/L
		Opening Balance			6,800.00	
					6,800.00	x
					6,800.00	x
					6,800.00	
					6,800.00	
					6,800.00	
					6,800.00	
					6,800.00	
					6,800.00	
					6,800.00	
					6,800.00	
					6,800.00	
					6,800.00	
					6,800.00	
					6,800.00	

2015 Budget: $6,800

Publications/Reports: $100
Public Education, Information Gathering: $6,000
Conferences/Workshops: $500
Membership Fees: $200
Total

A