

Meewasin Northeast Swale Master Plan

November 6, 2015



A prized natural feature within Saskatoon's urban landscape: a refuge for wildlife and people alike, where disturbance mimics natural patterns, biodiversity is high, native species flourish and residents or visitors of Saskatoon can learn from and enjoy wilderness right outside their own backyard.

Meewasin 

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Acknowledgements

The Meewasin Valley Authority acknowledges the valuable advice and ideas provided by the *Meewasin Northeast Swale Master Plan* Steering Committee, Technical Advisory Committee and stakeholders.

Meewasin recognizes the strong participation from the City of Saskatoon in the Master Plan process. Their commitment includes staff participation in the Design Charrette, Steering Committee, Technical Advisory Committee, Public Open House, City Committees consultation, public consultation and the sharing of data and information.

The report was written by Sarina Gersher and Erin Akins and the design work was completed by Nola Stein and Jonathan Behnke.

Meewasin Project Team

Alan Otterbein – Design & Development Manager
Colleen Yates – Principal, Equinox3 Consulting Ltd.
Doug Porteous – Community Development Manager
Erin Akins – Project Coordinator
Eryn Tomlinson – Resource Management Assistant
Jonathan Behnke – Design Assistant
Kenton Lysak – Senior Interpreter
Luc Delanoy – Conservation Officer
Mike Velonas – Planning & Conservation Manager
Nola Stein – Project Designer
Renny Grilz – Resource Management Officer
Sarina Gersher – GIS Analyst and Mapping Technician

Steering Committee

Meewasin Valley Authority:
Alan Otterbein – Design & Development Manager
Doug Porteous – Community Development Manager
Mike Velonas – Planning & Conservation Manager

City of Saskatoon:
Alan Wallace – Director of Planning & Development
Brenda Wallace – Director of Environmental & Corporate Initiatives
Cary Humphrey – Director of Recreation & Sport
Darren Crilly – Director of Parks
Frank Long – Director of Saskatoon Land

Technical Advisory Committee

City of Saskatoon:

Amber Jones – Education and Environmental Performance Manager

Andrew Hildebrandt – Storm Water Utility Manager

Brad Babyak – Integrated Facility Supervisor

Elan Ballantyne – Recreation & Sport, Open Space Consultant

Elisabeth Miller – Safe Growth/CPTED Representative & Senior Planner, Neighbourhood Safety

Gerald Rees – Parks Superintendent

Terry Fusco – Senior Planner, Long Range Planning

Tyson McShane – Senior Planner, Saskatoon Land

Stakeholders:

Barbara Hanbidge – Swale Watcher and Policy Specialist, Ducks Unlimited Canada

Claire Bullaro – Saskatoon Heritage Society

Les Henry – Soil and Hydrology Specialist, University of Saskatchewan

Peter Goode – Conservation Advisor

Stan Shadick – Swale Watcher and Vegetation and Wildlife Specialist

Cover Page

Photo: Shannon Dyck (Northeast Swale - Nature's swimming hole, 2013).

Quote: the *Northeast Swale Resource Management Plan* (Meewasin Valley Authority, 2013, p. iv).

Approvals

City of Saskatoon: October 26, 2015

Meewasin Valley Authority: November 6, 2015

Definitions

The Meewasin Northeast Swale (The Swale) – the whole Swale from Peturrson's Ravine, extending northeast approximately 26 kilometres through the Rural Municipalities of Corman Park and Aberdeen. The Swale is approximately 2,800 hectares. It is made up of two parts, one within the City of Saskatoon limits and the other outside of the city, known as the greater Swale.

The Greater Swale – this is the portion of the Swale that is outside of the City of Saskatoon limits. It is the larger of the two pieces and is roughly 90% of the feature.

The Master Plan is directed specifically at the lands within the City of Saskatoon, but is meant to be the basis for decision making and provide direction relating to the ongoing development of the Swale and adjacent lands. The Master Plan's design ideas and recommendations may also be applied to similar sites such as the adjacent Small Swale and the greater Swale.

The Small Swale - this is a swale also located in the northeast sector of the City of Saskatoon, however it is not a part of the Meewasin Northeast Swale.

Executive Summary

Extending north from Peturrson's Ravine in Saskatoon to the Rural Municipality of Aberdeen, the Meewasin Northeast Swale is a channel scar that is approximately 26 kilometres long and covers 2,800 hectares. It is the result of the post-glacial South Saskatchewan River carving one of many paths weaving through the landscape over 15,000 years ago, evolving as the waters subsided into a unique geological, hydrological and ecological area. This distinctive and rugged landscape has existed for many thousands of years and remained relatively intact in that time. It provides significant ecological services as a diverse, connected network of rare native prairie, riparian areas and wetlands, all within reach of the Saskatoon area.

The Swale is unique, not only locally, but within the context of the greater prairie region. It has intrinsic value as a natural system, as urban ecological infrastructure and as a significant neighbourhood, city and provincial amenity. Ongoing protection, selective development, resource management, education and conservation will support and enhance these values.

From a jurisdiction perspective, the Meewasin Northeast Swale consists of two parts: lands within the City of Saskatoon (the Swale), and lands within the Rural Municipality of Corman Park and Aberdeen (the greater Swale). The Swale, within Saskatoon city limits (primarily owned by the City of Saskatoon), is approximately 300 hectares in size and 5 kilometres in length (roughly 10% of the greater Swale area).

The ***Meewasin Northeast Swale Master Plan*** was developed for the Swale within the City of Saskatoon, to support and foster **Conservation, Education, and passive Recreation**. It aligns with the Strategic Plans of both the Meewasin Valley Authority and the City of Saskatoon (Meewasin Valley Authority, 2014; City of Saskatoon, 2013), and it builds on important previous work including the *Northeast Swale Resource Management Plan* (Meewasin Valley Authority, 2013) and the *Northeast Swale Development Guidelines (2012)* (Stantec Consulting Ltd., 2012).

Human activity and urban growth within city limits will have long term impacts on the Swale. Currently this activity includes the planning and development of residential neighbourhoods (Evergreen, Aspen Ridge and University Heights 3), the City's North Commuter Parkway and the Provincial Perimeter Highway. The Swale is also a significant piece of ecological urban infrastructure, providing a site for stormwater management systems for adjacent developments. Given all of these impacts, comprehensive planning and ongoing resource management are necessary to conserve this valuable resource.

The design ideas and recommendations within this Master Plan are intended to be conceptual, and will require further detailed design as development proceeds. It will be the basis for decision making and provide direction relating to the ongoing development of the Swale and adjacent lands. The Master Plan's design ideas and recommendations may also be applied to similar sites such as the adjacent Small Swale and the greater Swale.

The Master Plan process began in early 2014 with the establishment of an internal project team and two committees: Steering and Technical Advisory. A Design Charrette initiated the design process by bringing over 45 experts, key stakeholders and students together to work in a group

format, generating design concepts and ideas. Following the Charrette, design options were refined, and a report was developed. Consultations with the project team, committees, public and key stakeholders have been ongoing throughout this process.

The previously completed *Northeast Swale Resource Management Plan* (Meewasin Valley Authority, 2013) divided the site into a number of zones that provided a base layer of information for the design. These four zones include the Ecological Core, Recreational Zone, Greenway and Stormwater Pond.

A design program was developed that identifies the intended outcomes of the Master Plan. These have guided the development of the Plan and include key ideas such as **conserving biodiversity** (including the accommodation of ongoing resource management), **supporting passive recreation activities, accommodating educational programming, interpreting cultural and natural history** and **supporting a communications plan**. Other critical design considerations include minimizing site fragmentation, accommodating wildlife corridors and connectivity, maintaining nocturnal light levels, providing for pedestrian connections to adjacent areas, and providing for public safety, comfort and accessibility.

To meet the goals of the design program, proposed amenities include: the Greenway, trails, boardwalks, parking, facilities and amenities, signage, fencing, access control and lighting. Proposed amenities include over 16 kilometres of trails (the Greenway and internal trails), interpretive features, over 7 kilometres of fencing and an Outdoor Education Staging Area.

The cost opinion to implement the Master Plan totals approximately \$6.1 million dollars for work within the Swale or \$20,260 per hectare (\$8,213 per acre), not including the Outdoor Education Staging Area or the Greenway. There is an additional option for post construction, one year maintenance totaling approximately \$250,000. The cost to develop the Greenway totals approximately \$8 million dollars. The Resource Management and Communication Plan costs, based on a five year work plan, total approximately \$778,000 and \$75,000 respectively. The Education Plan costs are approximately \$110,000. These totals are based on 2014 dollars, without an inflation factor.

Ongoing collaboration with Meewasin's funding partners will be necessary to determine a sound funding strategy for implementation, operation and life cycle replacement. The completed Master Plan provides baseline costing information and proposes a number of sequential development phases with an unknown overall timeframe (the work would be synchronized with adjacent development). The cost opinion for each phase is provided as well as data that will assist in determining ongoing operating costs.

The work completed to date has been collaborative, with significant investments in time and consultation from Meewasin, the City of Saskatoon, key stakeholders and the public. This collaborative approach must continue to ensure the successful implementation of the Master Plan and conservation of this valuable resource. Once endorsed by the Meewasin Valley Authority and the City of Saskatoon, this document will be a mutually accepted plan that outlines the framework for ongoing planning and development in the Swale.

Background

The Meewasin Northeast Swale (the Swale) is unique in that it exemplifies the prairies. Native grasslands are one of the most imperiled ecosystems on the planet (Gauthier & Riemer, 2003), where only 20% of native prairie remains in Saskatchewan (Bailey, McCartney, & Schellenberg, 2010, p. iv). The Swale represents the Saskatchewan prairie landscape that is now considered endangered (Trottier, 1992).



Figure 1
Meewasin Northeast Swale (City of Saskatoon, 2014)

Value of the Meewasin Northeast Swale

The Swale holds significant value locally and regionally, as a relatively intact natural system. It has intrinsic value as a natural system, as urban ecological infrastructure and as a significant neighbourhood, city and provincial amenity. Protection, selective development, resource management, education programming and conservation will support these values over time.

From a value perspective, the Swale provides the following:

- Conservation of a remnant prairie grassland ecosystem with high levels of biodiversity and natural capital;
- A carbon sink, helping with greenhouse gas emissions;

- Exposure to historic, culturally and environmentally significant areas that provide a 'sense of place' that is unique to Saskatoon and the region. These benefits help make Saskatoon a more desirable region to live and work;
- Increased property values adjacent to the Swale, and therefore increased tax based revenue. The relationship between access and proximity to open space and property value has been studied extensively, and is referred to as the Proximate Principle. Research indicates that there may be up to a 25% increase in property values adjacent to open spaces, depending on a number of variables (and sometimes higher in certain circumstances) (Alberta Real Estate Foundation, 2007);
- Surface stormwater utility management;
- Active transportation corridors and routes;
- Contributing factor to healthy lifestyles, improved health and well-being;
- A tourist attraction;
- Outdoor and environmental education and research opportunities (allowing new and existing partnerships to flourish); and
- Valuable and accessible passive recreation opportunities within easy reach of numerous neighbourhoods.

Project Objective

The objective of the *Meewasin Northeast Swale Master Plan* is to design the physical space, including pathways and amenities in the Meewasin Northeast Swale (the Swale), within the city limits such that it supports Conservation (resource management), Education and Development (passive recreational uses) consistent with *The Meewasin Valley Project* (Raymond Moriyama Architects and Planners, 1978), *An Inventory of Natural Areas Remaining in the Vicinity of Saskatoon* (Johnson and Weichel, 1992), the *Vegetation and Wildlife Survey of the Northeast Swale Near Saskatoon* (Meewasin Valley Authority, 2001), the *Northeast Swale Development Guidelines (2012)* (Stantec Consulting Ltd., 2012), the *Northeast Swale Resource Management Plan* (Meewasin Valley Authority, 2013), the *University Heights Sector Plan* (City of Saskatoon, 2013), Meewasin's Strategic Plan, *A World-Class Corridor, a Vision for the Meewasin Valley 2014-2024* (Meewasin Valley Authority, 2014) and the *Northeast Policy* (Meewasin Valley Authority, 2015). The Master Plan also aligns with the City of Saskatoon's *Strategic Plan 2013 – 2023* (City of Saskatoon, 2013), specifically with the goals of Environmental Leadership, Sustainable Growth, Moving Around and Quality of Life.

As a Master Plan, all design ideas and recommendations are conceptual, and will require further detailed design as development proceeds. The Master Plan will be the basis for decision making and provide direction relating to the ongoing development of the Swale and adjacent lands. The Master Plan's design ideas and recommendations have been developed with the ability to be scaled and applied to similar sites such as the adjacent Small Swale and the greater Swale, currently outside of city limits.

The Meewasin Valley Project – 100 Year Conceptual Master Plan (1978)

The Meewasin Valley Authority's (Meewasin) foundation document is *The Meewasin Valley Project* (Raymond Moriyama Architects and Planners, 1978) and guides Meewasin's overall development plan today. Meewasin initiatives strive toward the outcomes of health, fit, balance and vibrancy. The Swale is identified as a natural area and corridor in the 100 year plan.

An Inventory of Natural Areas Remaining in the Vicinity of Saskatoon (1992)

An Inventory of Natural Areas Remaining in the Vicinity of Saskatoon (Johnson and Weichel, 1992) was a report which compiled the remaining natural areas of priority in Saskatoon and area for land planning and management decisions. The Meewasin Northeast Swale was identified in this report as a priority for protection. The Swale was also recognized as the "largest natural area in the vicinity of the city" (Johnson and Weichel, 1992, p. 10).

Vegetation and Wildlife Survey of the Northeast Swale Near Saskatoon (2001)

The *Vegetation and Wildlife Survey of the Northeast Swale Near Saskatoon* (Meewasin Valley Authority, 2001) was one of the first opportunities Meewasin had to gather a detailed survey of species in the Meewasin Northeast Swale, and surrounding area. This survey captured large numbers of plants and bird species (206 plant species and 181 bird species) in addition to a high relative cover of fescue grass (13%) (Meewasin Valley Authority, 2001, p. 2).

The Northeast Swale Development Guidelines (2012)

The *Northeast Swale Development Guidelines (2012)* (Stantec Consulting Ltd., 2012, p. 1.1) provides direction for the minimization of disturbance to the Swale, while also meeting transportation, utility, stormwater management and other community needs. The document replaces the original 2002 guidelines as it contains additional details on the Swale boundary, road crossings and stormwater management, and introduces the concept of the Greenway.

The Northeast Swale Resource Management Plan (2013)

The *Northeast Swale Resource Management Plan* (Meewasin Valley Authority, 2013) envisions the site as a prized natural feature within Saskatoon's urban landscape: a refuge for wildlife and people alike, where disturbance mimics natural patterns, biodiversity is high, native species flourish, and residents or visitors of Saskatoon can learn from and enjoy the wilderness right outside their own backyard. The plan outlines a management approach to protect and restore biodiversity, unique landscape characteristics and heritage features inherent in the Swale. It prescribes burning, grazing, invasive species control and an adaptive management approach.

The *Northeast Swale Resource Management Plan* also recommends that Meewasin develop a Recreation Plan for the Swale that:

- Integrates landscape planning for the Swale;
- Ensures passive recreation uses only (e.g. no off-leash dogs and on-leash dogs limited to certain areas);
- Considers varying intensity and activity types for different zones in the Swale, including the Greenway, Ecological Core, Recreation Zone and Stormwater Ponds; and
- Incorporates interpretive opportunities for both individuals and groups.

University Heights Sector Plan (2013)

The *University Heights Sector Plan* (City of Saskatoon, 2013) established a new Suburban Development Area for Saskatoon, established a layout for preparation of future Neighbourhood Concept Plans and identified key land uses, transportation and servicing. This plan has direct implications for the Meewasin Northeast Swale as it falls within the Sector boundaries. Considerations such as transportation, stormwater management and alternative transportation corridors affect the Swale.

The Meewasin Valley Authority's Strategic Plan, A World-Class Corridor, a Vision for the Meewasin Valley 2014-2024

A World-Class Corridor, a Vision for the Meewasin Valley 2014-2024 (Meewasin Valley Authority, 2014) is a document that will guide the work of Meewasin to 2024. The document presents a vision for the Meewasin Valley articulated through 3 major themes:

- Healthy and Vibrant;
- Sense of Community; and
- Protecting the Legacy.

The Meewasin Valley is a unique and world-class feature that must be protected and supported. This document details the actions required to achieve the goals set and identifies key directions necessary to achieve the vision and respond to growth. The Master Plan aligns with the Strategic Plan in the following areas:

- Healthy and Vibrant
 - A healthy, natural river corridor supporting the wellbeing of present and future generations (2014, p. 8);
 - Extend the Meewasin Trail and amenities to better serve a community that is growing quickly (2014, p. 8); and
 - Promote participation and appreciation by planning for and supporting activities and programs in all seasons (2014, p. 8).
- Sense of Community
 - Foster community participation and meaningful contribution to conservation and development projects (2014, p. 12).
- Protecting the Legacy
 - Renew the Meewasin Valley Interpretive Plan with an aim to enhance experiential learning opportunities (2014, p. 16).

The Northeast Policy (2015)

The Meewasin Valley Authority adopted a Northeast Policy as part of the Development Plan in 1987 to guide its decision making and planning in the northeast quadrant. At that time the available information on the Meewasin Northeast Swale was limited and the policy recommended further research. A fully revised *Northeast Policy* was adopted by the Authority in 2015 in conjunction with the City of Saskatoon and University of Saskatchewan (Meewasin Valley Authority, 2015). Based on research during the intervening years, the Meewasin Northeast Swale was identified as a key natural area in the quadrant. The policy recommended the development of a Master Plan to address recreation, education and interpretation.

The City of Saskatoon's Strategic Plan 2013 - 2023

The *Strategic Plan 2013– 2023* (City of Saskatoon, 2013) for the City of Saskatoon contains priorities that align with the Master Plan as follows:

- Environmental Leadership
 - Supporting biodiversity and the Meewasin Valley (2013, p. 31);
 - Committing to healthy and growing urban and grassland parks which are natural assets to be protected, enhanced and linked (2013, p. 31);
 - Improving the quality and reducing quantity of stormwater run-off entering the river (2013, p. 32);
 - Improving access to ecological systems and spaces, both natural and naturalized (2013, p. 32); and
 - Communicating the financial benefit of environmental initiatives (2013, p. 32).
- Sustainable Growth
 - Planning collaboratively with partners and stakeholders (2013, p. 36); and
 - Measuring residents' perception of the quality of their neighbourhood (2013, p. 37).
- Moving Around
 - Working on the North Commuter Parkway Project (2013, p. 40); and
 - Measuring length and quality of walking and cycling network (2013, p. 41).
- Quality of Life
 - Providing access to citizens to facilities and programs which promote active living, and enjoying the natural beauty and benefits of parks, trails and the Meewasin Valley which brings people together (2013, p. 27);
 - Finding new and creative ways to showcase Saskatoon's natural and cultural heritage (2013, p. 27);
 - Working collaboratively through conversation to move forward as a community (2013, p. 27);
 - Ensuring existing and future recreational facilities are physically and financially accessible and meet community needs (2013, p. 28);
 - Providing opportunities for activities in a winter city (2013, p. 28); and
 - Measuring public perceptions of quality of life (2013, p. 29).

Planning Principles

Planning undertaken by Meewasin is guided by five fundamental planning principles:

- Valley's resources are accessible to everyone;
- Conserve natural and heritage resources;
- Recreation and development balanced with conservation;
- Diverse activities for a varied and changing demographic; and
- Public participation in decision making.

Process

The *Northeast Swale Resource Management Plan* recommended plans for a Recreation, Education and Interpretation as well as a Communications Strategy for the Swale (Meewasin Valley Authority, 2013, p. viii). *A World-Class Corridor, a Vision for the Meewasin Valley 2014-*

2024 refers to the development of an interpretive plan for the Meewasin Northeast Swale, coordinated with trail planning (Meewasin Valley Authority, 2014, p. 19). This prompted work to begin on the Master Plan with the intention of incorporating recreation, education, interpretation and communications. Meewasin created an internal project team to draft a Terms of Reference for the Master Plan. This included establishing a Steering Committee and a Technical Advisory Committee with the Terms of Reference describing the duties and expectations of the project team and each of the Committees (see Appendix C).

Design work was initiated with a Design Charrette held in April 2014, which provided a one-day interdisciplinary, creative design exercise to kick-start the process. It involved over 45 experts, key stakeholders and students. The full design charrette report, *Design Charrette Northeast Swale Master Plan (2014)* can be found on Meewasin's website.

Following the Design Charrette, options were developed and refined and the draft report was compiled. This work has been guided by the Steering Committee and the Technical Advisory Committee throughout 2014 and 2015. The draft concept plan was released in fall 2014 and Meewasin hosted an open house in October 2014 to obtain feedback and input from members of the public.

Prior to release of the final report, additional consultation included meetings with groups, such as the Swale Watchers and Wanuskewin Heritage Park and meetings within the City of Saskatoon including their committees: Standing Policy Committee on Planning, Development and Community Services, Municipal Heritage Advisory Committee (MHAC), Saskatoon Environmental Advisory Committee (SEAC) and Crime Prevention Through Environmental Design (CPTED). Meewasin advisory committees (Development Review, Conservation, Education, and Design) have also reviewed the Master Plan.

After completion, the report must be presented to the Meewasin Valley Authority Board of Directors and City of Saskatoon City Council for approval.

Site Description

The Swale is a channel scar, the result of an ancient river carving a path on the landscape, creating unique geological, hydrological and ecological conditions. The wetlands within the Swale are sustained by the Forestry Farm aquifer, where the ground water is not really affected by surface topography (BBT Geotechnical Consultants Ltd., 1986; Meewasin Valley Authority, 2013, p. 10) . The water table for this site is high and defined as a zone of unserviceable land (Stantec Consulting Ltd., 2012; Meewasin Valley Authority, 2013, p. 10).

The Swale has two distinct parts: lands within the City of Saskatoon and lands within the Rural Municipalities of Corman Park and Aberdeen (i.e. greater Swale). See Appendix A Figure A-1 for a map of the estimated Swale extent. The estimated extent of the Meewasin Northeast Swale is approximately 2,800 hectares (ha) and 26 kilometres (km) in length. The Swale begins within Saskatoon at Peturrson's Ravine and extends northeast about 26 km through the Rural

Municipality of Corman Park and reaches the South Saskatchewan River at a ravine near Columbus Bosco Homes, near Clark's Crossing and again within the Rural Municipality of Aberdeen. The scope of the Master Plan refers to the Swale within Saskatoon city limits, which is owned primarily by the City of Saskatoon. The Swale within the City of Saskatoon is approximately 300 ha and 5 km in length (roughly 10% of the greater Swale area). Unless otherwise stated, the Swale referenced throughout the Master Plan is the section located within the City of Saskatoon.



Figure 2
Meewasin Northeast Swale and adjacent neighbourhoods
(City of Saskatoon, 2014)

Location

The Swale is located in the northeastern corner of the City of Saskatoon, in the University Heights Suburban Development Area. See Appendix A Figure A-2 for a location map of the Swale. The majority of the Swale is within Meewasin's jurisdiction and Conservation Zone. See Appendix A Figure A-3 for a map illustrating the current Meewasin jurisdiction for the Swale. The *Northeast Policy (2015)* recommends that the remaining Swale lands and Small Swale lands be added to Meewasin's jurisdiction (Meewasin Valley Authority, 2015).

Ecological Importance

The Swale contains a variety of environments including steep rocky ridges, rolling prairie, lush valleys, treed areas and ephemeral and semi-permanent wetlands. These environments provide significant ecological services, and contain over 200 documented plant species, 103 avian species and a variety of mammals within the 300 ha of Swale in Saskatoon alone (Meewasin Valley Authority, 2013). Some of the rare or endangered species in the Swale include plants (Crowfoot Violet, Western Red Lily, Narrow-leaved Water Plantain, Sweet Grass), birds (Sprague's Pipit, Barn Swallow, Loggerhead Shrike, Horned Grebe, Short-eared Owl, Common Nighthawk) and amphibians (Northern Leopard Frog) (Meewasin Valley Authority, 2013). Maintaining biodiversity is integral to the health, success and future of this ecosystem.

Cultural History

There are many intact and visible heritage features found at the Swale. Remnants are still visible from the Moose Woods-Batoche Trail, which provides insight and interpretation opportunities into transportation systems and routes used at various time periods and by different groups in the area such as First Nations, Métis and early Saskatoon-era settlers

(Meewasin Valley Authority, 2013, p. 16). As a result of the glacial rivers that formed in the Swale, large limestone boulders were deposited on the site. These boulders were used for making fertilizer, mortar and to clad buildings. The Swale contains limestone quarries, lime kilns and a pinned rock, which are all evidence that the limestones found on site were being used for construction, including some early University of Saskatchewan construction projects (Meewasin Valley Authority, 2013, p. 17).

The Swale lands entered Meewasin's jurisdiction through ownership by the University of Saskatchewan. In addition to the geomorphology of the site, it is through the University's ownership that the Swale was protected from large disturbances. Ownership of the Swale has since transferred to the City of Saskatoon. The Swale is on Treaty 6 lands (Office of the Treaty Commissioner, 2015).

Adjacent Natural Areas and Connections

The Meewasin Trail runs along both sides of the Meewasin Valley and currently extends to both Crocus Prairie and Saskatoon Natural Grasslands. The proximity of these sites allows for a convenient connection to the existing Meewasin Trail system. Other potential future connections to the Meewasin Trail system can be seen on Appendix A Figure A-4, including connections to Saskatoon Natural Grasslands, Crocus Prairie, Peggy McKercher Conservation Area and the Saskatoon Forestry Farm Park & Zoo.

The Swale is part of a larger natural areas corridor in the northeast of Saskatoon. Due to suburban development, some of these natural areas have been separated, limiting connectivity. It is critical that the Swale maintains connectivity to these adjacent natural areas.

Crocus Prairie is a riverside site directly connected to Peturrson's Ravine and geographically located next to the Regional Psychiatric Centre. Crocus Prairie is part of the continuous link of core areas of native habitat with other remnant natural areas (Meewasin Valley Authority, 2013, p. 1). The Meewasin Trail runs through Crocus Prairie.

Peggy McKercher Conservation Area, previously known as Maryville, is a riverside site with cultural significance. The site used to be owned by the Episcopal Corporation of Saskatoon who converted the site to a summer residence for Catholic nuns in the Saskatoon Diocese (Meewasin Valley Authority, 2009). Peggy McKercher Conservation Area contains a section of the Meewasin Trail and provides connectivity from the Small Swale to the South Saskatchewan River.

Peturrson's Ravine connects the Swale to the South Saskatchewan River. It contains a marl bog which is a unique ecosystem due to its soil and moisture properties and unique floral community (Golder Associates Ltd., 1995, p. 19). To protect Peturrson's Ravine, it should be hydrologically isolated from potentially contaminated surface run-off from nearby subdivisions (Stantec Consulting Ltd., 2012, p. 3.14).

Riddell Paleontological Site is an important site where vertebrate fossils, ocherous wood and shells have been found. Nineteen taxa of large mammals from the late Rancholabrean time were also uncovered at this site (City of Saskatoon, 2013, p. 14). It is located north of the Swale along Central Avenue.

The Small Swale is similar to the Swale in its topography, although it is not connected to the Forestry Farm aquifer (Meewasin Valley Authority, 2013, p. 10). The Small Swale connects to the South Saskatchewan River at two locations and is composed of grasslands and wetlands (Stantec Consulting Ltd., 2013, p. 31). It is critical to restore this natural area and maintain the connection to adjacent natural areas in order to protect the biodiversity and health of this natural system. The Master Plan recommends maintaining a linear park connection and trail between the Small Swale and the Meewasin Northeast Swale.

Saskatoon Forestry Farm Park & Zoo is a National Historic Site started as a tree nursery hosting millions of saplings which now remain a cornerstone of ecology for the prairies (City of Saskatoon, 2015). The aquifer for this area is the same one which recharges the Swale. The Meewasin Trail currently connects to the Saskatoon Forestry Farm Park & Zoo.

Saskatoon Natural Grasslands aims to preserve the ecological integrity of this remnant prairie while providing a living laboratory for environmental education and interpretation (Delcan Western Ltd., 1994, p. 1). This area also provides a corridor for wildlife to the river and the Swale. The Meewasin Trail currently connects to Saskatoon Natural Grasslands.

The University of Saskatchewan Reclamation Site is an area directly south of the Swale along Central Avenue, providing habitat and connectivity to Peturrson's Ravine and the South Saskatchewan River. Although this area is not ecologically sensitive, it provides connectivity to other adjacent natural areas. This is especially important as the Swale narrows along Central Avenue and could pose a challenge for wildlife movement and connectivity.

The Master Plan

The Master Plan outlines a comprehensive site plan addressing the following elements:

- Design of the Greenway, Ecological Core, Buffer Zone and Recreation Zone;
- Greenway and trail design including pathways, site access and connectivity to adjacent land uses, adjacent neighborhoods and crossing features;
- Amenity design based on permissible uses, safety and comfort, including site furniture and signage; and
- Site design to support resource management, interpretation and programming.

The Conceptual Design can be found in Appendix A Figure A-4. A simplified version of the Conceptual Design can be found in Appendix A Figure A-5.



Figure 3
Northern Leopard Frog at the Swale (Dyck, 2013)

The Design Program

The intended outcomes of Swale development and the Site Design Program are organized based on the categories of activities that are supported. These categories include conserving biodiversity, supporting passive recreation, supporting education, interpreting natural and

cultural history and supporting a communications plan. The categories have guided the creation and development of the Master Plan. See Appendix A Figure A-6 for the Site Design Program and Appendix A Figure A-7 for a matrix evaluating the Master Plan and how it intends to meet the Design Program goals.

Site Considerations

The Swale is a unique feature. As such, it requires different treatment than a conventional or naturalized park. Specifically, this site focuses on connectivity and ecology, which requires identification and management of permissible, restricted and prohibited uses. All activities at the Swale should be passive recreation, not active recreation.

The Swale is not currently publically accessible, permission must be granted to use the site. It is not until certain phases of the Master Plan are implemented that the site will become publicly accessible. In the future, it is the goal of Meewasin that the Swale will be open for public use, but for the time being is accessible with permission.

Connectivity & Wildlife

The Swale is an important wildlife connection leading to the South Saskatchewan River. The *Northeast Swale Resource Management Plan* describes the wildlife found within the Swale that relies on this connection, including birds, mammals, amphibians, reptiles and insect (Meewasin Valley Authority, 2013). The Swale also provides physical connection to the South Saskatchewan River in three locations (Saskatoon, near Clark's Crossing and the RM of Aberdeen) and connects wildlife to surrounding natural areas and greenspace such as Saskatoon Natural Grasslands, Saskatoon Forestry Farm Park & Zoo, Peturrson's Ravine, the University of Saskatchewan Reclamation Site and Crocus Prairie. Connectivity between these areas and to the South Saskatchewan River is critical to maintain natural corridors where possible. Minimizing fragmentation must be a priority when designing features within the Swale.

Human Impacts

The Swale has remained virtually untouched as the water table is high and makes the land unserviceable. As a result, the Swale had been used to graze animals. Parts of this area have been overgrazed but have also demonstrated resiliency. The Swale's proximity to new and growing neighbourhoods has created a critical window of opportunity. Current and future suburban growth will claim land up to the edge of this resource. While recognizing that the Swale will change, human encroachment could result in unprecedented and non-reversible impacts to the site. These damaging impacts could be caused by increased noise and light levels, construction activity, illegal dumping, foot and vehicle traffic, off road recreation activities, littering, pets at large, vandalism, bonfires, theft of plants, camping, horseback riding; and other recreation activities such as model airplanes (Meewasin Valley Authority, 2013, pp. 50-51). Proactive monitoring could help mitigate or reduce the type of changes that could happen in the Swale.

Permissible Uses

Although there is a concern about some activity in the Swale, there are also a number of activities that will be supported and encouraged. The Swale contains a number of sensitive

areas and the following suggested uses will allow appreciation, education and conservation of the site:

- Walking;
- Hiking;
- Wildlife watching;
- Appreciation of flora and fauna;
- Photography;
- Appreciation of the scenic vistas;
- Inspiring interpretive site exploration opportunities for individuals and guided tours (such as school groups);
- Research; and
- Geo-caching.

Restricted Uses

Activities in the Ecological Core are subject to controlled use due to its sensitive nature. A number of activities will be permitted at the Swale, but restricted to certain areas:

- Biking
 - Permitted on primary, secondary, Greenway and boardwalk trails only.
- Cross-country skiing
 - Potential for development in Recreation Zone; and
 - Potential for guided use in Ecological Core.
- Snowshoeing
 - Potential for development in Recreation Zone; and
 - Potential for guided use in Ecological Core.
- Picnicking
 - Restricted to the Recreation Zone.
- On-leash dogs
 - Restricted to the Recreation Zone.

Prohibited Uses

It is recommended that the following uses be prohibited in all areas of the Swale:

- Off-leash dogs (Bylaw No. 7860);
- ATVs (Bylaw No. 7767);
- Snowmobiles (Bylaw No. 7767);
- Power driven vessel;
- Other motorized vehicles (except motorized devices for the mobility impaired and emergency and service vehicles) (Bylaw No. 7767);
- Picking wildflowers (Bylaw No. 7767);
- Dumping (Bylaw No. 5713); and
- Littering (Bylaw No. 7767).

With development proceeding on all sides of the Swale, there is increasing public demand for dog parks in the area. As the Swale is not suitable for off-leash use, it will be important to

determine appropriate location(s) nearby for this activity that can accommodate demand and reduce the risk of off-leash activity within the Swale.



Figure 4
Meewasin Northeast Swale (City of Saskatoon, 2011)

Design Components

This section includes a full detailed description of the design elements and amenities included within the *Meewasin Northeast Swale Master Plan*. The following components are based on the Conceptual Design, which can be found in Appendix A Figure A-4. Detailed design work will be undertaken as phased site development is initiated.

Site Zones

For the purpose of both resource management and site planning, the area within the Swale has been divided into different zones (Meewasin Valley Authority, 2013). Each zone has a different intended use and function. The four zones are the Greenway, the Ecological Core, the Stormwater Ponds and the Recreation Zone. See Appendix A Figure A-8 for a map illustrating the four zones.

The Greenway

The *Northeast Swale Development Guidelines (2012)* (Stantec Consulting Ltd., 2012) established the concept of the Greenway. It is a multipurpose corridor along the perimeter of the

Swale that includes an ecological buffer, trail zone and transition zone. It supports active transportation, stormwater management and conservation of sensitive areas (Stantec Consulting Ltd., 2012).

Location

The Greenway follows the Swale edge where possible and frames the entirety of the northern side of the Swale and the boundary of the Aspen Ridge neighbourhood on the south edge. The Greenway will serve as a transition between suburban development (typically single family residences) and the Swale. Residential backyards will back on to the Greenway.

Along Fedoruk Drive and Central Avenue, the Swale is bordered by roadways and therefore does not include the Greenway. These areas will differ from the Greenway in that they will not include all the same elements; the cycling pathways are included in the roadway development. A pedestrian pathway and ecological buffer is planned along the roadways.

Cross Section

The Greenway consists of three components: the Ecological Buffer, the Trail Zone and the Transition Zone.

- The Ecological Buffer is located next to the Swale edge and is planted with native species. It is a minimum of 15 meters wide that is widened to a 20 meter minimum if the slope towards the Swale is 5% or greater;
- The Trail Zone is located adjacent to the buffer. It is 3-4 meters wide and will feature a shared use path; and
- The Transition Zone separates adjacent land uses and supports stormwater management. It ranges from 3 – 5 meters in width; 5 meters minimum width if adjacent to residential development or used for stormwater management or 3 meters minimum width if adjacent to roads and other land uses.

Neighbourhood development may include a fence at the back of the lot line, or fencing may be installed by the homeowner as part of the yard landscaping (Saskatoon Land, 2014). See Figure 4 for a cross section of the Greenway.

Ecological Buffer

The function of the Ecological Buffer is to protect the Swale from invasive and exotic species encroachment. The *Northeast Swale Development Guidelines (2012)* (Stantec Consulting Ltd., 2012) suggests that this area should be planted with a mix of native species, and will require active, ongoing management to prevent and minimize invasive species encroachment.

The Swale side of the Ecological Buffer will be delineated with a fence to protect the Swale. This fencing will also provide access control along the perimeter of the Ecological Core. Delineating the edge of the Swale will help to signify the importance of this natural area.

Areas currently within the Ecological Buffer contain a mixture of native and exotic species. These areas will require efforts for invasive species management, seeding and/or natural

regeneration in order to control invasive species and reintroduce native species (Stantec Consulting Ltd., 2012, p. 3.4).

Trail Zone

The Trail Zone will support a shared use path for active transportation. The initial phase will include construction of a fully accessible asphalt trail. It is anticipated that this trail will be cleared for four-season use.

Transition Zone

The Transition Zone protects the Swale from encroaching invasive and exotic species from adjacent land uses. This zone has the potential to be a tool in the City of Saskatoon's stormwater management system and integrated with low impact stormwater management practises.

Suggested low impact stormwater management practices include a grass swale, bioswales, rain gardens or linear retention ponds. Vegetation in the Transition Zone should include only native vegetation, predominantly grass species.

Ecological Core

The Ecological Core is the heart of the Swale where resource management and biodiversity are the priority. The Ecological Core is intended to have controlled access and support passive recreation, research and education.

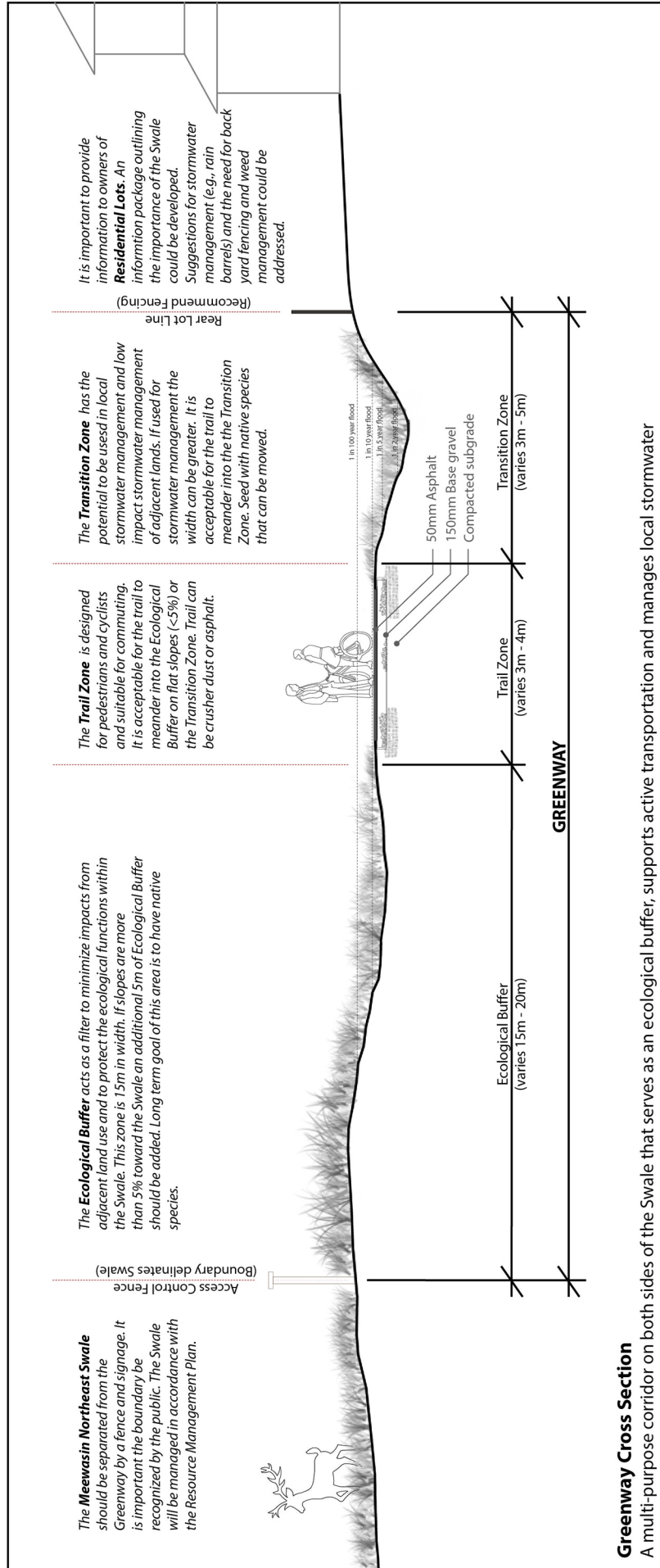
Access to this area will be controlled using fencing and access control points on its perimeter. Fencing will be used to delineate the area, manage grazing animals within the Swale and restrict prohibited access such as motorized vehicles. To encourage the use of designated trails, access points will open to secondary trails. Amenities will consist of low-impact trails whose surfaces are mowed, crusher dust, mulching or boardwalks. Resource management tools such as grazing, burning and adaptive invasive species management will be focused in this zone. In addition to active research, educational guided tours and interpretation are planned.

Stormwater Pond

The Stormwater Pond and surrounding area supports higher intensity use for recreation, education and development of trails. This area requires some restoration.

Recreation Zone

The Recreation Zone supports higher intensity use for recreation, education and development of trails. This area is adjacent to highly disturbed areas and can accommodate higher levels of human use.



Greenway Cross Section
A multi-purpose corridor on both sides of the Swale that serves as an ecological buffer, supports active transportation and manages local stormwater

Figure 5 - Greenway Cross Section

Road Alignment

The *Northeast Swale Development Guidelines (2012)* delineate the three planned road crossings through the Swale within the current City limits: the North Commuter Parkway, Central Avenue and Range Road 3050 (Stantec Consulting Ltd., 2012). In addition to these three roadways the Province also has plans to construct a controlled access highway through the Swale, referred to as the Perimeter Highway. All roadways crossing the Swale, with the exception of the Perimeter Highway, will have a posted speed limit of 50 km/h to reduce the risk of wildlife interactions (Stantec Consulting Ltd., 2012, p. 3.9).

North Commuter Parkway

The development of the North Commuter Parkway is subject to the *Northeast Swale Development Guidelines (2012)* (Stantec Consulting Ltd., 2012). The conceptual design has been approved by the Meewasin Valley Authority Board of Directors, with conditions.

Wildlife Considerations

As part of the conditions of approval, the design for the North Commuter Parkway must include culverts which will allow the natural flow between east and west, while providing consideration for small mammals, fish, reptiles and amphibian movement. Rocks, small shrubs and/or taller vegetation are recommended at the entry and exit to provide cover for the animals using the culverts (Stantec Consulting Ltd., 2012, p. 3.9). In addition, to minimize disturbance to mammals crossing the roadways, it is recommended that the culverts be designed to minimize grade changes (Stantec Consulting Ltd., 2012, p. 3.10).

Central Avenue

The widening and realignment of Central Avenue is part of the North Commuter Parkway project, and is subject to the *Northeast Swale Development Guidelines (2012)* (Stantec Consulting Ltd.).

Range Road 3050

The current north-south alignment for Range Road 3050, also known as Lowe Road, will be maintained as a potential road crossing. In accordance with the *Northeast Swale Development Guidelines (2012)* this collector roadway/utility crossing will lie along the existing centreline with a right-of-way 27 m wide and will connect Evergreen with the University Heights 3 neighbourhood (Stantec Consulting Ltd., 2012, p. 3.7).

Perimeter Highway

The location of the Perimeter Highway on the Conceptual Design (see Appendix A Figure A-4) is preliminary and subject to change. Based on consultation and review, Meewasin recommends that the alignment currently noted remain as the final configuration. Discussions between the Saskatchewan Department of Highways and Transportation, Meewasin and the City of Saskatoon are ongoing regarding this project. It is important to continue the dialogue as the Perimeter Highway progresses due to its potential impacts on the natural systems within the Swale and the Small Swale.

Decommissioned Roadways

Range Road 3045 currently runs through the Swale but will be decommissioned for vehicular access upon the construction of the North Commuter Parkway and Perimeter Highway. There is potential to use the existing road bed for trails and lookouts. The possibility of removing the roadbed and reconnecting the wetland crossed by this roadway is recommended.

Agra Road intersects Central Avenue and forms a portion of the northern boundary of the Swale. The plans for the North Commuter Parkway suggest there may be a need for a road at the intersection of Agra Road and Central Avenue, which will be determined by the City of Saskatoon as part of University Heights 3 development. Agra Road will be decommissioned if it is not necessary for this neighbourhood. Agra Road represents the boundary for the Greenway and if decommissioned, the existing infrastructure can be utilized for Greenway development.

The *Northeast Swale Development Guidelines (2012)* provides direction on decommissioning roadways in the Swale (Stantec Consulting Ltd., 2012).

Internal Trails

Secondary Trails in the Recreation Zone

Secondary trails within the Recreation Zone facilitate connections from major entry points to internal amenities such as the Outdoor Education Staging Area, picnic sites and interpretive nodes. The location of the trail in one section also follows the alignment of the historic Moose Woods-Batoche Trail. These trails will be designed to be fully accessible.

Future detailed design must consider the volume of trail users. The installation of trail counters at major entrances will assist in determining if the trail will be cleared in winter months; however, it is recommended that at least one north-south and east-west connection should be maintained during winter months.

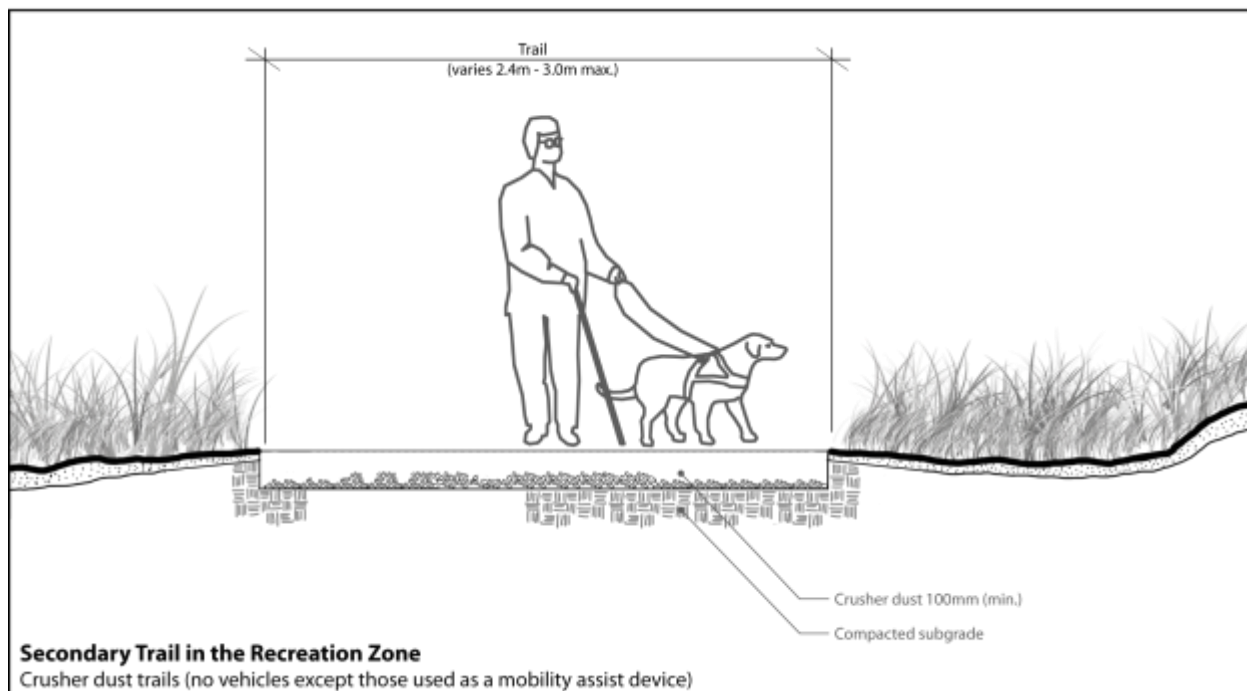


Figure 6 - Cross Section of a Secondary Trail in the Recreation Zone

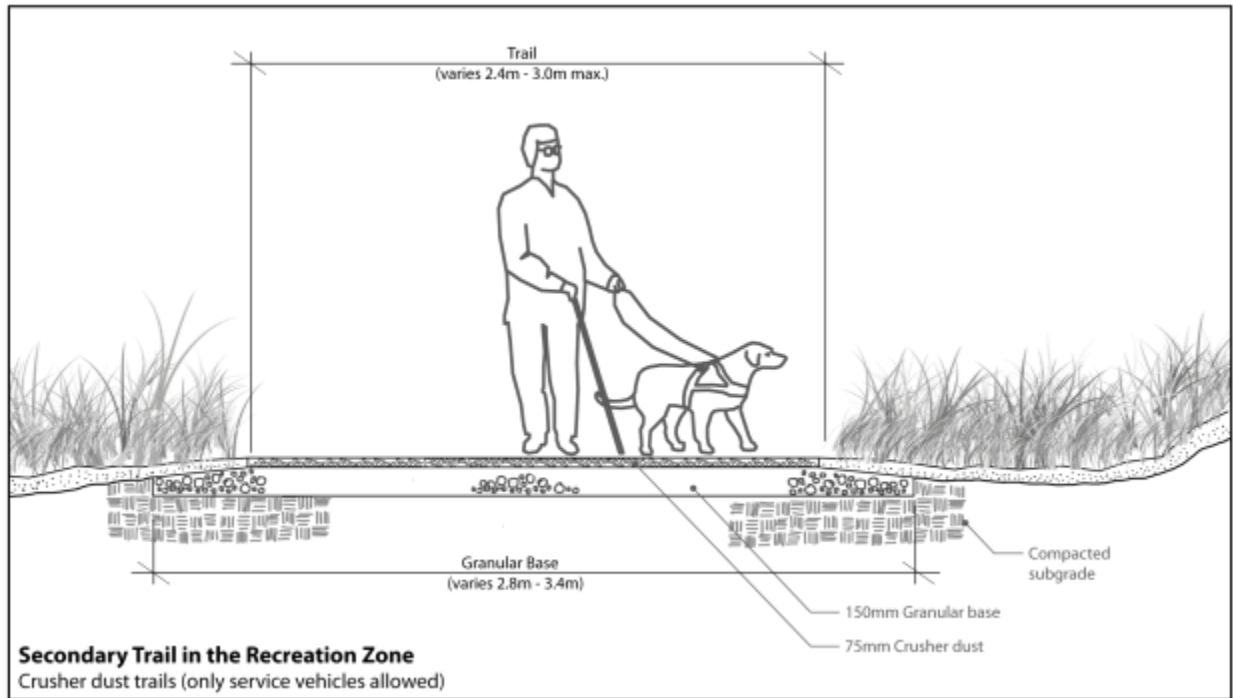


Figure 7 - Cross Section of a Secondary Trail in the Recreation Zone. Only service vehicles allowed.

Secondary Trails in the Ecological Core

The internal trail system within the Ecological Core features a trail that allows pedestrians to cross through the Swale. This trail also has a branch heading west that provides a connection to the Outdoor Education Staging Area. The alignment of this trail provides access to the major interpretive nodes in the Ecological Core.

This alignment was selected to minimize the impacts on highly sensitive and biodiverse areas, and to provide minimal grade changes for users.

This trail will be constructed on grade to minimize ground disturbances (no excavation of the existing ground). It will follow a similar model used at Saskatoon Natural Grasslands, which has performed very well and minimizes the introduction of additional invasive species to the site. The south terminus location of this trail will align with a proposed linear park connecting to the park system in Aspen Ridge, providing a strong connection back into the neighbourhood. The branch of the trail that connects west to the Outdoor Education Staging Area and Recreation Zone was aligned to make use of existing site disturbances (former farm access road).



Figure 8
Meewasin Trail - crusher dust at Crocus Prairie

There are also two trails located on the existing road bed of Range Road 3045 to facilitate interpretation and wildlife watching.

It should be determined in the future which trails will be cleared in winter months. Off-leash dogs and motorized vehicles will be prohibited and cycling will be discouraged. The primary use will be hiking and interpretive tours.

Future detailed design must consider the volume of trail users. The installation of trail counters at major entrances will assist in determining how and if the trail will be cleared in winter months.

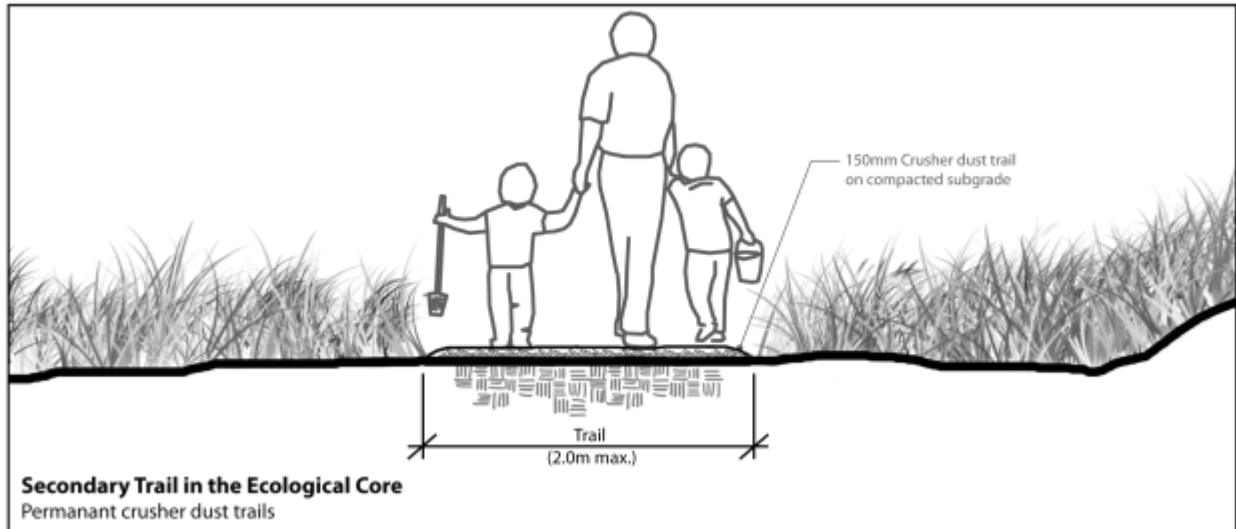


Figure 9 - Cross Section of a Secondary Trail in the Ecological Core

Tertiary Trails in the Ecological Core

The secondary crusher dust trail linkage will be supported by a tertiary trails system. Tertiary trails are mowed, semi-permanent trails and can be relocated occasionally to reduce long term impacts. The placement of these trails will depend on the resource management activities occurring in the Swale. These trails will not likely be visible in winter months.

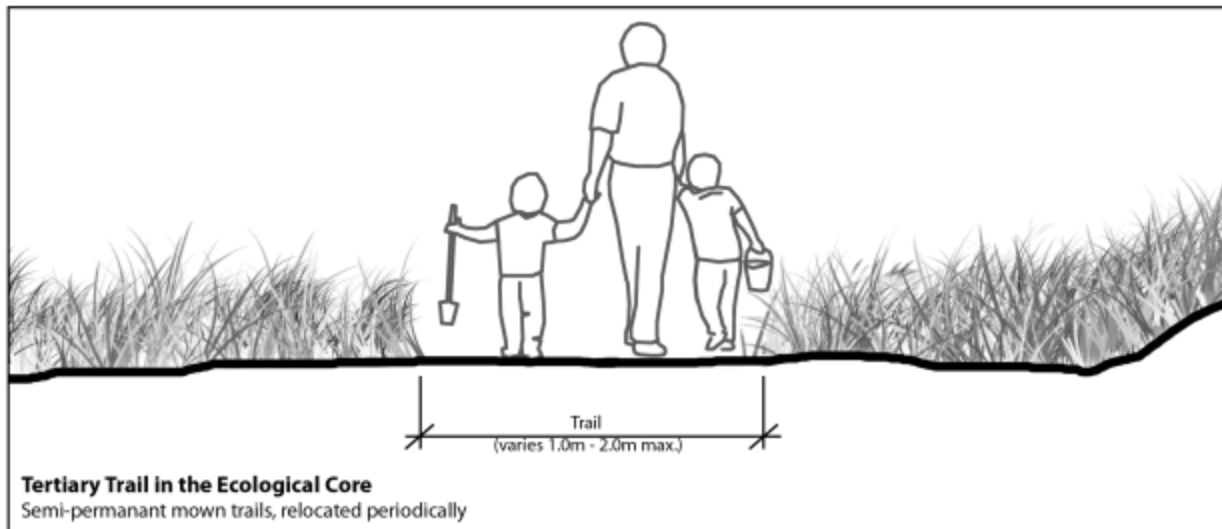


Figure 10 - Cross Section of a Tertiary Trail in the Ecological Core

Boardwalks

Boardwalks will be used to traverse wetlands or ecologically sensitive areas. The boardwalks will support bird watching activities and overall Swale viewing. A short trail and feature lookout is located off the North Commuter Parkway crossing, mid-way through the Swale. This trail will provide a vantage point to the Ecological Core, including some of the wetlands and provides an opportunity for interpretive signage.

The northern wetlands are the most active bird watching sites located in the Swale. There is potential for a boardwalk to be incorporated for wildlife viewing and pedestrian movement around the Aspen Ridge stormwater management system.



Figure 11
Example of boardwalk (Gone Hikin', 2011)

The boardwalks will not be accessible year round. Railings will be installed where necessary.

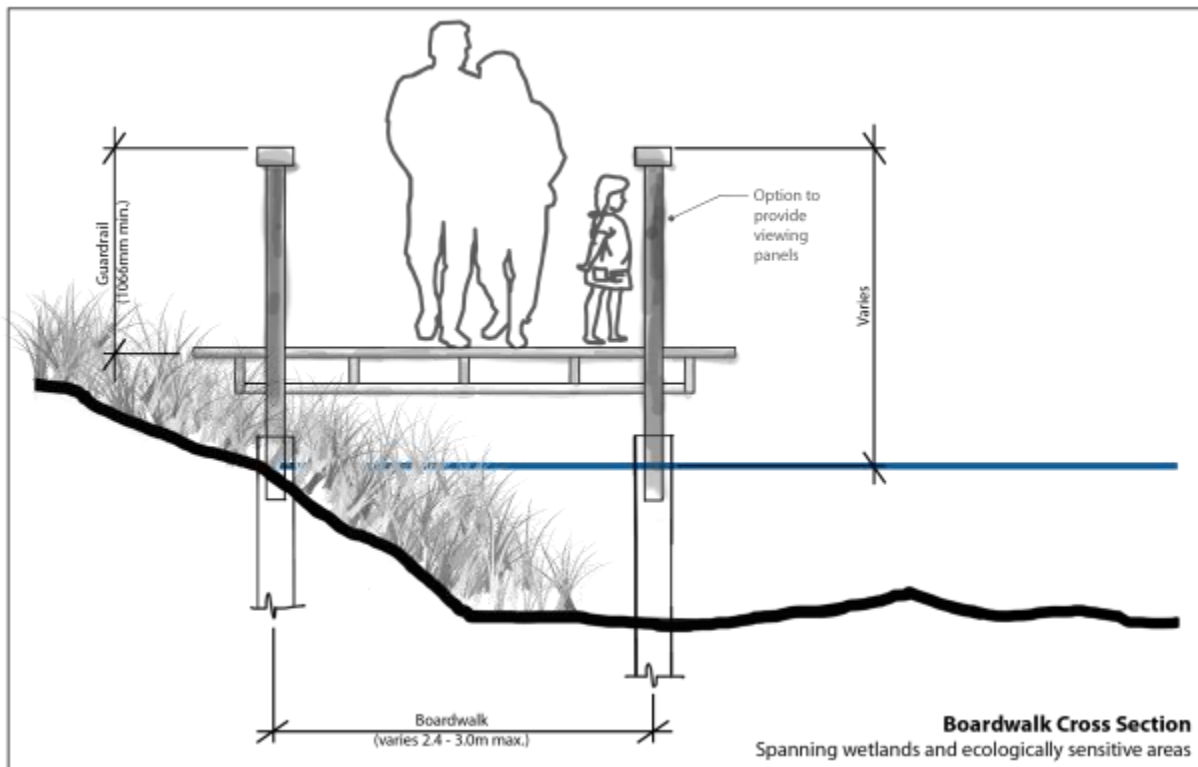


Figure 12 - Boardwalk Cross Section

External Trails

The trails outlined in this section are intended to inform future planning by identifying important linkages for shared use paths surrounding the Swale. These trails connect to surrounding natural areas and support both natural and human corridors.

Meewasin Trail

The most significant external trail linkage is to the Meewasin Trail. Currently, the existing trail terminates at Crocus Prairie, which is the south boundary of Peturrson's Ravine. The Master Plan recommends further trail development south along Central Avenue, connecting the Meewasin Trail to the Swale and continuing further north from this point. Trail development is also recommended along the top of bank through Peturrson's Ravine, further through private land holdings, with an eventual connection to the Peggy McKercher Conservation Area. Further detailed planning of trails in the northeast is anticipated as development proceeds in these areas.

Moose Woods-Batoche Trail

North of the Swale, the Master Plan illustrates a potential trail that could continue to follow the alignment of the historic Moose Woods-Batoche Trail. This trail has important cultural value that will be interpreted in the Swale. Including this trail into future neighbourhood design would reinforce the importance of this feature.

Linear Park and Trail to the Small Swale

The Master Plan proposes a trail through the Swale that connects with the linear park trail system in Aspen Ridge. A continuation of that trail is suggested to head north through University Heights 3 neighbourhood and across Central Avenue that would link in with potential future trails on the south boundary of the Small Swale. This would provide a strong linear pedestrian connection between the two swales and through the two neighbourhoods' park systems.

Amenities

Outdoor Education Staging Area

The central gathering point for visitors to the Swale will be the Outdoor Education Staging Area located in the Recreation Zone. It will provide good access to both the Recreation Zone and Ecological Core. The detailed design of the staging area remains to be undertaken, but the use of environmental sustainability technology may be suitable for the area. The Staging Area is intended to be an accessible public area, open year round.

The Staging Area will support all season classroom activities and group gatherings by providing visitor and activity information, shelter and a washroom facility. It will also have the ability to store materials required to host interpretive activities for large groups.

Further detailed design of the Outdoor Education Staging Area will require additional study and design. The roadway and parking lot design to provide access to the Staging Area will also need to be considered further.

Nodes

Major nodes are located at primary entry points into the Swale in both the Ecological Core and the Recreation Zone. Each major node will include benches, waste receptacles, and signage which may include interpretive, wayfinding and regulatory information.

Minor nodes are located along the Greenway and within the Recreation Zone, interspersed between

major nodes. Each minor node will include benches and possibly waste receptacles.

Interpretive nodes are located throughout the Swale. Each node will have seating, a viewpoint and interpretive panels.

Picnic Sites

Picnic sites will be located within the Recreation Zone and adjacent to the parking and washroom located at the Outdoor Education Staging Area.

It is anticipated that the Recreation Zone will support a number of picnic sites, subject to detailed design. Sites will include tables and waste receptacles. Some sites may also be designed to support larger groups with multiple tables. Shelters and barbecues may also be a potential option for these sites.

Washrooms

The primary washrooms will be located at the Outdoor Education Staging Area. There is potential for this site to have composting toilets as a low impact demonstration feature.

Additional washrooms will be located at the north parking lot. It is anticipated that the construction of this lot and the associated washrooms will be included in a later phase of construction. Since the northern portion of the Swale is not yet surrounded with residents, access to this portion of the Swale remains a lower priority.

Parking

Outdoor Education Staging Area

The primary parking lot within the Swale will be located at the Outdoor Education Staging Area within the Recreation Zone. This lot will be accessed from Fedoruk Drive via an access roadway. This parking lot will accommodate visitors to the Outdoor Education Staging Area, the



Figure 13
Example of minor seating node at
Conservation Easement



Figure 14
Example of picnic area
(Surrey Wildlife Trust)

picnicking sites and internal trails, and allow for the pickup and drop-off of school groups. The size of the parking lot remains to be determined. It is anticipated that this parking lot will be gravel and cleared for winter use. Range Road 3050 may also support some on street parking.

Central Avenue

A gravel parking lot exists on the west side of Central Avenue, at Crocus Prairie and Peturrson's Ravine. Visitors can access both the Meewasin Trail and the Swale from this lot. Pedestrians can cross Central Avenue at Fedoruk Drive to access the trails within the Recreation Zone. This location has approximately 16 parking stalls.

North Lot

A smaller parking lot in the north portion of the Ecological Core will improve access for trail users. This north lot is located at the north end of the Swale, near the Commuter Parkway.

The feasibility of creating an off-site parking lot (outside of the Swale) should be considered to minimize impacts. Parking within the Greenway or University Heights 3 may be a possible alternative. Disturbance to the Swale should be minimized.

Temporary Parking

Additional temporary parking for special events may be accommodated as needed in summer months by mowing non-sensitive areas. Temporary parking locations should be limited to areas where disturbances have already occurred, and planned in conjunction with Meewasin's Planning and Conservation Department.

Access

The Master Plan illustrates locations where the Ecological Core and Recreation Zone can be accessed by the public. The Recreation Zone is meant to accommodate the largest amount of public access. The *Northeast Swale Resource Management Plan* (Meewasin Valley Authority, 2013) recommends controlled access to the Ecological Core to help manage domestic grazing animals while providing a physical barrier to define the site. This will be a physical reminder of the importance of this area.

Greenway/Primary Trail Access

The Master Plan illustrates access points to the Greenway. Silverspring and Evergreen have pre-existing connections to Fedoruk Drive, where crosswalks will assist pedestrians in safely crossing the street to access the Recreation Zone. There is an existing berm along Fedoruk Drive that limits access to the Swale. In Aspen Ridge, proposed access points are based on planned connections to the Greenway through linear parks and pedestrian linkages.

The access points along the north Greenway, into the future University Heights 3 neighbourhood, have been located at similar intervals to those in Aspen Ridge. They may need to be adjusted based on future neighbourhood design.

Access to the Greenway does not necessarily provide access to the Swale; access to the Swale is limited to trail connection points (and illustrated with a yellow arrow on Appendix A Figure A-4). Access to the Ecological Core will be restricted by fencing and gates. The Recreation Zone will need controlled access defined as this area is actively being accessed for prohibited uses such as ATVs and off-leash dogs. See the fencing section on page 31 for further details on access to the Swale.

Pedestrian Crossings

The design of the roadways surrounding the Swale ensures that all entry points are located where pedestrians can cross to access the site. All of these crossing are at intersections, creating no midblock crossing points.

The North Commuter Parkway road design will include at least two mid-block pedestrian crossings within the Swale (Stantec Consulting Ltd., 2012, p. 3.9). See Appendix A Figure A-4 for the location of these light actuated crossings.

The Outdoor Education Staging Area will feature a parking lot for bus loading and unloading. Students will need to cross Range Road 3050 to get to the Ecological Core for guided tours. A crosswalk at the intersection of Range Road 3050 and Fedoruk Drive is anticipated.

Crosswalks are desirable for safe pedestrian connectivity at all road intersections along the perimeter of the Swale, including at Central Avenue, Konihowski Road, and Zary Road, as well as any future planned streets in University Heights 3. Pedestrian crossings for the Perimeter Highway will be subject to further discussion with the Department of Highways.

Resource Management

Resource management activities in the Swale are based on adaptive techniques that will include, but are not limited to, grazing animals, controlled burns and weed removal, as proposed in the *Northeast Swale Resource Management Plan* (Meewasin Valley Authority, 2013).

There are two proposed resource management access points and staging areas. The first is located north of Fedoruk Drive, just west of Range Road 3050. The second is located at the north parking lot. These staging areas will be accessed by a locked gate and not intended for public use or access.

Other features required to support resource management such as water supply, salt licks and corrals will be determined through Meewasin's Planning and Conservation Department as part of ongoing resource management activities.



Figure 15
Example of a resource management access gate (Moyfab Engineering Limited, 2012)

Emergency Services

There are proposed points along the perimeter fencing that allow for emergency vehicle access. A portion of the internal secondary trail within the Recreation Zone will be built to support emergency services' needs. The resource management access points will also allow emergency service access. In addition, due to the size of the Swale, signage and wayfinding will be developed to help orientate emergency service providers and users to their location within the site. For example "mile markers" could be installed along the Greenway with a site number that corresponds with latitudinal and longitudinal coordinates (see Figure 16). The naming of internal trails will also help with this wayfinding.

Signage

Signage is an important way to delineate the significance and value of the Swale. Wildlife crossing, pedestrian crossing and no stopping signage is recommended in the *Northeast Swale Development Guidelines (2012)* (Stantec Consulting Ltd., 2012, p. 3.9). All signage should follow Meewasin's existing brand and visual identity and be consistent with the Communication and Education Plans.

Interpretive Signage

Specifics of the interpretive signage will be subject to further research and detailed design. However, the Conceptual Design (Appendix A Figure A-4) offers suggestions for interpretation which include: limestone quarries, Moose Woods-Batoche Trail, stormwater management, wetland restoration, resource management, grassland ecology, rubbing stone, pinned rock, hydrology, geomorphology, grassland ecology, wetland ecology and riparian ecology.

Wayfinding Signage

Site wayfinding signage has not yet been designed. It must emphasize the importance of the Swale while providing location and directional guidance for people throughout and into the site and be consistent with the current brand.

Naming the internal trail within the Swale should be considered. Trails should be named to be consistent with the branding of the site. Trail names could potentially incorporate First Nations and Métis, ecological, cultural or heritage history.

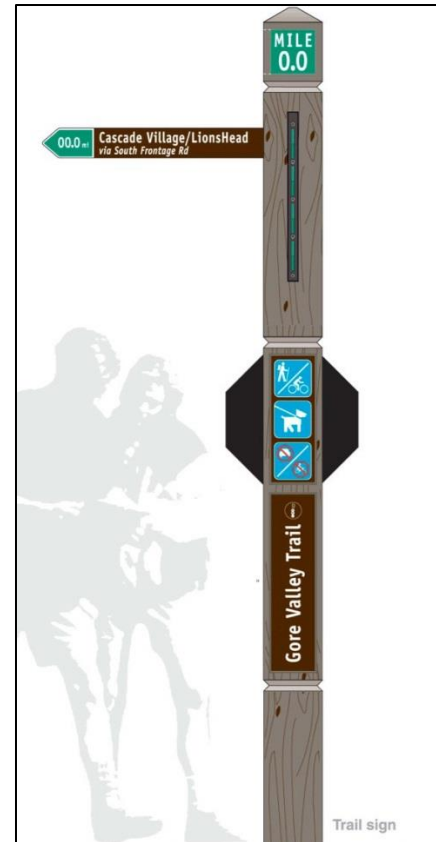


Figure 16
Example of a "mile marker"
(Corbin Design)



Figure 17
Example of interpretive signage at
Saskatoon Natural Grasslands

Regulatory Signage

To protect the Swale from unwanted uses, additional regulatory signage is required. The existing signs (see Figure 17) are situated at visible entrance points and fulfill a minimum requirement. Additional regulatory signage must be installed on site as soon as adjacent development occurs. Signage describing the importance of the site and the reason for its protection will support the regulatory signage and should be installed simultaneously. The Communications Plan currently underway will determine further signage requirements.

Figure 18
Existing predevelopment signage at the Swale (to be updated through the Communications Plan)

Fencing

It is critical to delineate the extent of the ecologically sensitive areas of the Swale as this will increase the understanding, emphasis and importance of the area. The *Northeast Swale Development Guidelines (2012)* supports this delineation by fencing and/or signage (Stantec Consulting Ltd., p. 3.4). It is imperative for visitors to understand the uniqueness and importance of the site and to foster a sense of stewardship within the community.

Fencing is the first component of the Master Plan. Signage providing information on the importance of the Swale and its permissible, restricted and prohibited uses should be installed in conjunction with the fencing.

The remainder of the Swale, including the Recreation Zone and section of the Ecological Core east of the North Commuter Parkway should include measures for access control and protection of the site.

Ecological Core

Wildlife-friendly fencing will be used along the complete perimeter of the Ecological Core. Although fencing is only delineated south of the North Commuter Parkway on the Conceptual Design (see Appendix A Figure A-4), it is recommended that it continue to the north as well.

This fencing serves to control pedestrian access, ensuring that entry into the Swale occurs only at the designated trailheads. This fencing also provides control for animals grazing as part of resource management practices in the Ecological Core.

The fence will allow movement for wildlife travelling through the Swale. Access to the internal trails will be determined upon detailed design but may include gates, removable fence and panels. In addition, openings at regular intervals in the fence along the roadway sections to allow for improved wildlife movement should be considered. These openings can be blocked off as needed with temporary fencing to allow for grazing.



Figure 19
Example of access control gates (Centrewire)

Additional internal fencing may be required to manage grazing activities within the Swale. This fencing will be temporary in nature and will allow different parts of the Swale to be chosen for animal grazing. This fencing is part of the resource management operations within the Swale.

Recreation Zone

The Recreation Zone will not have the same controlled access as the Ecological Core. To protect this area from prohibited activities (i.e. ATV and off-leash dog use) it is recommended that it also have a physical delineation. Further work must be done to determine the best method of delineation but options include bollards and fencing.

Stormwater Management

The Swale provides many ecological services, including stormwater management. There are both natural and constructed stormwater systems present.

The *Northeast Swale Resource Management Plan* notes two stormwater management systems, one for Aspen Ridge and another for University Heights 3, north of the Swale. Existing

stormwater management ponds (dry and wet) exist in the Recreation Zone (Meewasin Valley Authority, 2013). Information for stormwater management can be found in the Aspen Ridge Neighbourhood Concept Plan (Saskatoon Land, 2014) and the Evergreen Neighbourhood Concept Plan (Land Branch, 2009).

An additional stormwater management system is being proposed on the north side of the Swale, (for University Heights 3) between the North Commuter Parkway and Perimeter Highway. Given the potential negative impact this could have on animal connectivity and natural systems at this location, further study and exploration of options are necessary. It is recommended that additional land be added to the Swale boundary to compensate for the fragmentation of the site between the North Commuter Parkway and Perimeter Highway. See Figure 20 for the suggested area of land. Although land has not been

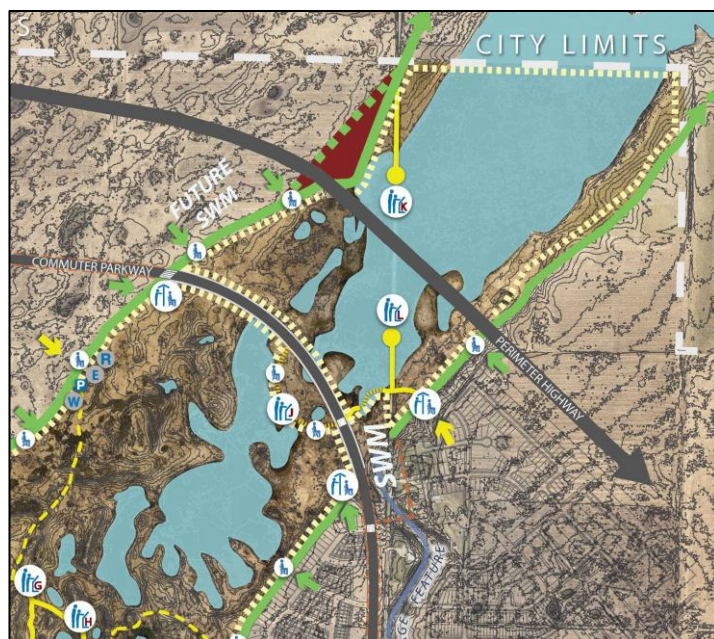


Figure 20
Area of additional potential land for the Swale north of Commuter Parkway. See the red shaded area.

dedicated for Swale boundary alterations, the dotted future Greenway line shows a potential area to be considered in the future. This portion of land is unserviceable, due to its high water table and grades. Although the vegetation is predominantly non-native, it can be restored and incorporated into the Swale.

Environmental Design Considerations

Design components found in this plan reflect potential changes to the Swale landscape. These changes can have positive, negative or neutral effects. These effects should be considered and if negative should be mitigated where possible.

Lighting

Lighting will be limited to reduce impacts to wildlife in the Swale. The site is intended to be predominantly unlit, as light pollution can have a negative effect on flora and fauna. Effects of increased light levels include altering the natural patterns and behaviours of wildlife and the flowering and dormancy period of plants (Dick, 2013, p. 2). If any lighting is needed it must be dark sky compliant. *The Meewasin Trail Study* contains recommendations and considerations for lighting with the Meewasin Valley (Meewasin Valley Authority, 2014).

Nocturnal Preserve

A nocturnal preserve designation through the Royal Astronomical Society of Canada (RASC) can help preserve darkness on site that will help maintain natural ecosystems and processes.

According to the RASC, a nocturnal preserve “is an area accessible to the public in which all lighting fixtures within its borders minimize their contribution to light pollution: glare, light trespass and sky glow” (Dick, 2013, p. 2). This designation will also assist to educate users about the value of darkness. Examples of nocturnal or dark-sky preserves in Canada include Cypress Hills Interprovincial Park Dark-sky Preserve (Saskatchewan), Grasslands National Park Dark-sky Preserve (Saskatchewan) and Rouge Park (Toronto, Ontario) (Huziak, 2015). It is recommended that the feasibility of creating a nocturnal preserve on site be researched further.

Roadways

There will be four roadways crossing the Swale, Central Avenue, Range Road 3050, the North Commuter Parkway and Perimeter Highway. The *Northeast Swale Development Guidelines (2012)* require street lighting at all crossings to be dark sky compliant (Stantec Consulting Ltd., p. 3.9). The Perimeter Highway will follow guidelines from the Ministry of Highways.

Greenway

If the Greenway is lit, lighting will be designed to support a safe active transportation corridor with a link from the surrounding neighbourhoods to the Meewasin Valley and downtown in all seasons. The asphalt cycling lane along Fedoruk Drive will be lit with roadway lighting.

Further discussion is needed to determine what measures can be put in place to best manage lighting within the Greenway. One option may be to time the lighting to switch off from midnight to 5:00 am when trail usage is minimal.

Outdoor Education Staging Area

If lighting is needed for the Outdoor Education Staging Area, it should reflect nocturnal preserve guidelines. Methods should be considered to reduce light use outside of regular hours of operation. External lighting for the staging area should only be used for programming requirements.

Views & Vistas

Viewsheds within the Swale should be maintained where possible. Nodes (major, minor and interpretative) can be used in these places. The Swale should be consistent with the view protection plan for the Meewasin Valley suggested in *The Meewasin Trail Study* (Meewasin Valley Authority, 2014). The experience of a site is important, and as such protecting views should be a priority. As mentioned in *The Meewasin Trail Study* “identification, establishment, re-establishment and protection of these areas are an important component to the Meewasin Valley” (Meewasin Valley Authority, 2014, p. 23).

Soundscapes

As the Swale and its surroundings change, there should be consideration for the soundscape. The Swale currently has species that rely on low levels of noise for breeding and habitat. There are also residents and visitors who come to the Swale to experience and listen to nature. As development proceeds, the Swale may change. This change may include the soundscape, as there may be increased levels of vehicle traffic and human presence.

Accessibility

Part of the unique aspect of the Swale is its topography and physical characteristics. The landscape varies between “steep rocky ridges, rolling prairie, lush valleys, treed areas and ephemeral wetlands” (Meewasin Valley Authority, 2013, p. 1). Due to the varying topography, the Swale’s Ecological Core may require assisted accessibility and will be determined as detailed design proceeds. It is ideal to provide as much accessible trail and infrastructure as possible.

Trails

Trails within the Recreation Zone will be designed and constructed to Meewasin’s standard trail detail with a maximum grade of 5%. The feasibility of meeting the 5% maximum grade within the Ecological Core secondary internal trails will be determined during detailed design. Maintaining the ecological integrity of the Ecological Core will be a special consideration during the detailed design.

Interpretation

The interpretation features throughout the Swale, including signage and the Outdoor Education Staging Area should consider visual and hearing impairments. The washrooms located at the Outdoor Education Staging Area will be designed to meet accessibility standards.

Public Art

The Swale has many interesting interpretation opportunities including human heritage, ecology and glaciation. These histories may be interpreted through on site public art that will also enhance the cultural experience and provide another means for interpretation and education of the unique characteristics in the area. Similar installations have been completed recently at Mark Thompson Park located in the Stonebridge neighbourhood where art was developed to help interpret the remnant Moose Jaw Trail on that site.

Discussions have begun between Meewasin and the City of Saskatoon to incorporate public art on site at the Swale.

Implementation

As a master planning document, all design ideas and recommendations are intended to provide a conceptual level of detail and will require further detailed design. The Master Plan is the basis for decision making and provides direction relating to the development of the Meewasin Northeast Swale and adjacent lands.



Figure 21
Sheep Grazing at the Meewasin Northeast Swale with Jared Epp

Funding Strategy

Ongoing collaboration with Meewasin's partners will be necessary to determine a sound strategy for implementation and annual operating costs. The completed Master Plan provides baseline information to help in this regard. The collaborative approach undertaken for the Master Plan must continue to ensure its successful implementation and conservation of the Swale itself.

Capital Development and Funding

Meewasin has compiled a cost opinion for the Master Plan which includes approximately \$6.1 million dollars for development work within the Swale (not including the Outdoor Education Staging Area or the Greenway). There is an additional option for post construction, one year maintenance totaling approximately \$250,000. The cost to develop the Greenway totals \$8 million dollars. The Resource Management and Communication Plan costs, based on a five year work plan to start but would be ongoing afterwards, totals approximately \$778,000 and \$75,000 respectively. The Education Plan costs are approximately \$110,000. These totals are based on 2014 dollars and do not consider inflation. The cost remains undetermined for the Outdoor Education Staging Area until further planning and design have been undertaken. See the Section on Construction (page 41) for additional information on costing and phasing.

The Meewasin Northeast Swale

The size of the Swale within City limits is approximately 300 ha (740 ac) and translates to an average cost opinion of approximately \$20,260 per ha (approximately \$8,213 per ac). This is a relatively low unit cost when compared with standard neighbourhood park development, or typical residential neighbourhood development. This low unit cost is due to the overall type and method of development that is intended to minimize adverse effects on the existing natural systems and ecological services.

Greenway

The Greenway protects the Swale and public access. It is multi-functional to the Swale, neighbourhoods, City and region. One aspect of functionality is being a component of adjacent neighbourhood infrastructure (overland drainage and temporary storage). The cost opinion noted of \$8 million is based on a per acre cost to develop linear parks (City of Saskatoon Parks Branch values). Further analysis will be necessary to verify these costs.

Funding Requirements

The completed Master Plan provides baseline information to help determine the appropriate budgets and phasing for full implementation and any restoration required. It also provides quantitative data that will assist in determining ongoing operating costs pertaining to standard park and facility maintenance. Ongoing monitoring, resource management, education and programming costs must also be considered, as well as necessary life cycle replacement costs.

Ongoing Investments

The work completed to date, including the *Northeast Swale Development Guidelines (2012)* (Stantec Consulting Ltd., 2012), the *Northeast Swale Resource Management Plan* (Meewasin Valley Authority, 2013) and now the *Meewasin Northeast Swale Master Plan*, have all been collaborative projects with significant investments in time and consultation. To follow through with the recommendations and next steps, formulated in these reports and summarized on page 48, Meewasin will continue to invest significant resources in the Swale and collaborate with the City and other key stakeholders in the process.

Operating Impacts

Development within the Swale will result in operating costs. The phases noted in the Master Plan indicate preliminary quantities necessary to calculate operating impacts. These costs include operation and maintenance for standard park infrastructure and facilities. Other site work related to ongoing resource management can be completed by Meewasin, assuming appropriate funding is in place to complete this work.

Construction

Construction and development of the Master Plan is best done in conjunction with adjacent development. As such, the conceptual design has been separated into 5 phases of construction.

Construction is dependent on adjacent development and funding opportunities, therefore dates have not been assigned. There is flexibility for each phase to be completed in smaller stages. The development of the Swale may be a gradual process but is still meant to be proactive in its implementation. The Swale will be surrounded by new residential development and will face increased pressure on its ecosystem. It is important to be proactive and delineate the importance of this site as soon as possible.

Monitoring

In accordance with the *Northeast Swale Development Guidelines (2012)* (Stantec Consulting Ltd., 2012), onsite and adjacent development monitoring is recommended. During construction the land owner must ensure that an independent environmental monitor is on site for regular inspections (e.g. every second day) (Stantec Consulting Ltd., 2012, p. 3.10). The monitoring of reclamation success post construction should continue until the right-of-way and disturbed lands are vegetated (Stantec Consulting Ltd., 2012, p. 3.12).

Phases of Construction

Item	Description (*see the accompanying phasing drawings in Appendix B)
Phase 1	<ul style="list-style-type: none">• Fencing the Ecological Core, east of the stormwater management system to the North Commuter Parkway.• Delineate the Recreation Zone through bollards, signage or fencing.• Trail along south edge of the Swale from Central Avenue to Aspen Ridge neighbourhood, adjacent to Fedoruk Drive.• Trail along Central Avenue, south of Fedoruk Drive to Silverspring neighbourhood.• The east-west trail and the south trails within the Recreation Zone up to the stormwater management system (pond).• Resource Management access points (north and south).• Emergency services access points.• Interpretive nodes in the south portion of the Recreation Zone.• Seating nodes (major/minor) in the south portion of the Recreation Zone.• Seating nodes (major/minor) in the Ecological Core adjacent to Fedoruk Drive.
Phase 2	<ul style="list-style-type: none">• Southern Greenway along Aspen Ridge neighbourhood.• Establish a mown edge for the north Greenway bordering University Heights 3.• North-south internal secondary trail in the Ecological Core from Aspen Ridge to

	<p>University Heights 3.</p> <ul style="list-style-type: none"> • East-west internal secondary trail in the Ecological Core. • Interpretive nodes in the Ecological Core along the secondary trails (east-west/north-south). • Major seating nodes adjacent to the secondary trails (east-west/north-south) in the Ecological Core. • Minor Seating nodes adjacent to Aspen Ridge neighbourhood.
Phase 3	<ul style="list-style-type: none"> • Northern Greenway along University Heights 3 to North Commuter Parkway. • North trails in the Recreation Zone and the trails east of the stormwater management system (pond). • Internal tertiary trails in the Ecological Core. • Interpretive nodes between Central Avenue and North Commuter Parkway. • Seating nodes (major/minor) between Central Avenue and North Commuter Parkway. • Parking for Outdoor Education Staging Area. • Trail along Central Avenue, north of Fedoruk Drive to University Heights 3. • Picnic areas.
Phase 4	<ul style="list-style-type: none"> • Fencing between the North Commuter Parkway and Perimeter Highway. • Greenway between the North Commuter Parkway and Perimeter Highway. • Feature lookout from the North Commuter Parkway in the Ecological Core. • Trail along Range Road 3045, between the North Commuter Parkway and Perimeter Highway. • Interpretive nodes along the feature lookout and internal trails. • Seating nodes (major/minor) along the feature lookout, North Commuter Parkway and the Greenway. • North washroom. • North parking lot.
Phase 5	<ul style="list-style-type: none"> • Fencing from Perimeter Highway to City limits. • Greenway from Perimeter Highway to City limits. • Boardwalk in Recreation Zone. • Outdoor Education Staging Area. • Trail along Range Road 3045, between Perimeter Highway and City limits. • Interpretive node between Perimeter Highway and City limits. • Seating nodes (minor) along Perimeter Highway.

Phasing Notes

Phase 5 contains the Outdoor Education Staging Area, which like all other design components is subject to available funding, but it is not subject to adjacent development. As such, the Outdoor Education Staging Area may be built at any time.

Preparing construction specifications for the Greenway will include sections on native seed mixes, seed rates and construction maintenance practices. As adjacent and internal

development occurs, any native vegetation, such as the fescue located in University Heights 3, should be transplanted and conserved.

See Appendix C for more detailed information regarding phases of construction, including a construction phase quantity matrix and figures of each phase.

Cost Opinion

A cost opinion has been prepared for the design components of the Master Plan. This cost opinion is based on 2014 pricing and does not include inflation. In addition, the cost for the Greenway has been separated and based on the City of Saskatoon's per acre costs for developing linear parks. The Outdoor Education Staging Area has not been considered in the cost opinion as the cost is highly variable depending on the programming and detailed design.

See Appendix B for more detailed information regarding the cost opinion, including phasing maps and matrices.

Effectiveness

For the purpose of future effectiveness reporting, the Design Site Program will serve as Meewasin's objectives for the Meewasin Northeast Swale (Appendix A Figure A-6). It defines elements of the program that articulate the outcomes of a successful design. Some of these program objectives will be qualitative and some can be measured quantitatively.



Figure 22
Monitoring at the Swale (Christensen, 2011)

Environmental Monitoring

It is recommended that the Swale be monitored for nighttime levels of noise, light and movement immediately, during adjacent development and continuing upon the completion of development. Nocturnal light and ambient sound levels directly impact flora and fauna. Monitoring these levels as adjacent areas are developed can provide valuable information that will assist in understanding the impact of adjacent development on the natural systems. This monitoring can be undertaken by Meewasin in conjunction with community partners.

Monitoring the Swale should also continue in conjunction with the *Northeast Swale Resource Management Plan* (Meewasin Valley Authority, 2013) to measure biodiversity, health of the habitat, wildlife and flora and fauna.

Site Users

As development proceeds, it is important to understand usage of the Swale. Trail counters can provide reliable data on types of users (cyclist or pedestrians) and use patterns. This information will be helpful in future site planning.

Going Forward

The following section provides recommendations for work that is not yet completed or requires a funding source.



Figure 23
Pinned Rock (DAFT Media, 2011)

Communication Plan

A Communication Plan is required, which “provides the framework for establishing a Communication Strategy that will: celebrate the Swale as a treasured and valuable resource to Saskatoon and region; [and] foster a sense of stewardship and understanding for those living near and visiting the [Meewasin] Northeast Swale” (Meewasin Valley Authority, 2013, p. 7).

Naming the Swale

The current working title for the site is the Meewasin Northeast Swale. The Communications Plan will provide further insight into site naming.

Adjacent Neighbourhoods and Residents

According to the Aspen Ridge Neighbourhood Concept Plan, “information about the Greenway, the Swale, and the native plants existing in both, will be provided to all those who purchase a lot backing onto the Swale. This will include information on the value of the Swale, the function of

the Greenway, and how it relates to adjacent development. It will also identify the differences between a naturalized area like the Greenway and standard, irrigated linear and pocket parks that will exist throughout Aspen Ridge” (Saskatoon Land, 2014, p. 7). This information should also be extended to all neighbourhoods bordering the Swale, including Silverspring, Evergreen, Aspen Ridge and the future University Heights 3 neighbourhood north of the Swale. This distribution of information should be coordinated between the City of Saskatoon and Meewasin and must include an explanation of natural areas, nocturnal preserves, and suggestions on where to purchase lights that are dark sky compliant. A strategy for relaying this information to new home owners who did not originally purchase the lot should be identified as well.

Marketing and Visual Identification

A concise and consistent message is required for the Swale. The Communication Plan will cover the design and messaging of on-site signage, marketing, branding and social media awareness.

External Communication

With multiple and often overlapping civic projects underway (and ongoing changes in relevant personnel) it can be difficult to determine whom to contact as issues arise. Improvements in communication protocols would be beneficial. Possible options include establishing one City contact for all projects in the area, or establishing a development committee or working group that meets regularly. Improving communications relating to work activities within the Swale is beneficial to the success and conservation of the overall site.

Central Information Depository

Through research, curriculum and educational information, there is a large amount of data regarding the Swale. For ease of access, this information should be publically available through a central information depository. The location for this depository is yet to be determined.

Education Plan

The opportunity for education in the Swale is expansive and important, covering areas such as human history, natural history, glaciation and ecology. Further site interpretation must also be developed in conjunction with the educational goals set out in the plan.

Components of the Education Plan could potentially include an educational guide, similar to the one that was created for *Saskatoon Natural Grasslands Ecological Guide* (Meewasin Valley Authority, 2005). Information could be accessed through hard copies or digital/online resources. The curricula should include lesson plans for all grade levels, with a strong focus on the Saskatchewan Ministry of Education’s Grade 6-8 curricular expectations.

Educational themes will include ecological theories and concepts, natural and geological history, biodiversity, sustainability and conservation, symbiosis and connections and civilian science. The activities should promote curiosity and enthusiasm for nature through hands-on learning while promoting scientific inquiry; and culturally an understanding of what has taken place in the past to better understand the future.

The goal of the Education Plan should be that youth experiencing education programs in the Swale, and Meewasin Valley, will become stewards in promoting the importance of wetland conservation, in addition to the conservation of all natural and cultural resources. It is important to provide connections to nature and engage youth as what they learn and understand now will have an influence on their future decisions.

Next Steps

Upon the completion of the Master Plan, the following steps must be completed to implement the design concepts. These steps will build on the collaboration between Meewasin and key stakeholders.

1. **Develop a funding strategy for capital construction.** A number of options have been presented regarding capital funding. For the Master Plan to be implemented effectively in concert with adjacent development it is imperative that sufficient capital resources be allocated at the appropriate time.
2. **As funding becomes available, proceed with Phase 1 implementation of the Master Plan.** Install fencing and signage for the Ecological Core, as shown on Phase 1 of the Master Plan. It is important to delineate the sensitive areas within the Swale and help protect the Swale's biodiversity from unwanted use and activities. Fencing will also allow for grazing as part of ongoing resource management. Continue with phased development in concert with adjacent development. Detailed design work and tendering of the initial phase of work can proceed as early as 2015, subject to staff capacity and funding. Details such as mowing the internal secondary trails within the Ecological Core in 2015/2016 should be considered. This would allow for users to test the trail routes before construction to allow for further refinement for improved accessibility and minimization of negative impacts.
3. **Detailed design and project management to implement phased development within the Swale, according to the section on Phases of Construction.**
4. **Develop operating impacts for standard maintenance.** Preliminary quantities have been determined as part of the Master Plan, organized per implementation phase. As projects are developed and completed, accurate detailed design and as-built data will be determined.
5. **Plan for Meewasin Trail development for the remainder of the northeast sector.** *The Meewasin Trail Study* (Meewasin Valley Authority, 2014) was recently completed, providing information regarding current and projected usage and gaps within the current trail network. The northeast sector has been a consideration of *The Meewasin Trail Study*, but will require further detailed design upon incorporation. In addition, Meewasin will be preparing a Trails Master Plan which will inform the expansion of the Meewasin Trail within the northeast sector.
6. **Develop a program plan and conceptual design for the Outdoor Education Staging Area.** The proposed facility is intended to support site recreation activities, educational programming, resource management and research. More detailed program development

and conceptual design will be required to proceed further. It will allow for a better understanding of development costs, operational costs, needs and responsibilities.

7. **Amend the maintenance agreement between Meewasin and the City of Saskatoon to reflect the development of the Swale.** Updates to the agreement will be necessary as the Master Plan is implemented and regular maintenance and resource management operations are initiated.
8. **Pursue opportunities to showcase and raise awareness of the Master Plan and other Swale initiatives.** There are a number of potential methods that could include applying for professional awards, presenting or speaking about the Swale at events or conventions, pursuing media coverage, social media initiatives, publishing site research and hosting events on site.
9. **Add the remaining City Swale lands to Meewasin's jurisdiction.** As part of the implementation of the Northeast Policy, Meewasin has signed a memorandum of understanding with the City of Saskatoon regarding alteration of the Meewasin jurisdiction. Part of this includes adding those portions of the Swale, which are now within the City limits as a result of post-1979 boundary alterations, to Meewasin's Conservation Zone. This will enable Meewasin to expand its work in the Swale.
10. **Ensure connectivity remains a priority within the Swale.** An area of concern in regards to connectivity is in between the North Commuter Parkway and Perimeter Highway. This area contains Aspen Ridge's forebay, semi-permanent wetlands, two large roadways and a future stormwater management system for University Heights 3.
11. **Apply Master Plan concepts to similar sites.** Future planning for similar work in the Small Swale and ongoing discussion with all relevant organizations regarding the greater Swale. The ideas within the Master Plan are scalable for use at the Small Swale and the greater Swale.
12. **Continue research and collaboration with community partners.**
13. **Continue discussions pertaining to the Perimeter Highway.** Relevant discussions include the crossings of the Meewasin Northeast Swale, Small Swale and the Meewasin Valley (South Saskatchewan River).
14. **Define legal parcel.** The Swale is a unique landscape and site within Saskatoon and differs greatly from manicured parks. Legal designation of Swale lands is recommended to ensure long term protection in terms of public access and interest. This could include an Environmental Reserve designation and/or a conservation easement. In addition to the legal definition of the land, a Special Use Park definition best describes the site using current City of Saskatoon park definitions as noted in the Park Development Guidelines.

Summary of Recommendations

The following recommendations are supplemental to the core elements proposed in the Meewasin Northeast Swale Master Plan. These recommendations are not numbered in terms of priority.

Site Considerations

1. **Plan for dog parks in adjacent areas.** As adjacent neighbourhood development proceeds, there will be increasing pressure for dog parks. It is important to determine appropriate location(s) nearby as the Swale is not suitable for off-leash activities.

Design Components

2. **Investigate the feasibility of winter recreational activities in the Greenway.** This includes but is not limited to cross country-skiing and snowshoeing.
3. **Explore options to aid in maintaining natural systems and connectivity crossing all planned roads that intersect the Swale.** Connectivity is of integral importance in the conservation of natural systems. Road crossings in the Swale significantly impact the ability of wildlife to move freely through the Swale and to other areas. Mitigating the impacts of road crossings and site fragmentation, which can be a significant barrier to connectivity, is of the utmost importance.
4. **Install trail counters at major entrances.** Future detailed design must consider the volume of trail users and data gathered through trail counters can help inform this decision and will provide a cross section of the type of users.
5. **Explore opportunities to promote environmental initiatives at the Outdoor Education Staging Area.** The Outdoor Education Staging Area should be developed as a sustainable, resilient, or high efficiency building that provides an opportunity for education and ways of reducing the human ecological footprint.
6. **Use native plant species to re-vegetate the Stormwater Management Systems (ponds) and other disturbed areas.** Disturbed areas such as the stormwater management ponds provide a significant source of non-native, noxious and invasive vegetation. This significant disturbance facilitates the spread of unwanted vegetation to other more pristine areas and reduces the site's overall biodiversity.
7. **Research the feasibility of creating a nocturnal preserve.** A nocturnal preserve designation through the Royal Astronomical Society of Canada can help preserve darkness that will assist in maintaining the natural ecosystems and processes. It will also help educate users about the value of darkness.

8. **Pursue opportunities for the introduction of public art on site.** Public art can be used to enhance the cultural experience and provide another means for interpretation and education regarding the unique characteristics of the area.

Funding Strategy

9. **Explore the use of existing donor programs and develop new programs for the Swale to support development and ongoing resource management costs.**

Construction

10. **Prepare construction specifications for the Greenway.** This will include sections on native seed mixes, seed rates and construction maintenance practices.
11. **Determine a cost estimate upon detailed design.** The cost currently shown is a cost opinion based on 2014 numbers without inflation.
12. **Develop annual standard site operational costs.** This program must include pre and post development.
13. **Monitor site and adjacent construction.** It is critical that the Swale maintain its ecological integrity during construction. To effectively monitor all activity, environmental monitors must be on site, in accordance with the *Northeast Swale Development Guidelines (2012)* (Stantec Consulting Ltd., 2012, p. 3.10).
14. **Transplant any native vegetation from adjacent and internal development.** As development occurs, any native vegetation, such as the fescue located in University Heights 3, should be transplanted and used to re-vegetate disturbed areas.

Effectiveness

15. **Develop a program for ecological monitoring within the Swale.** This program should include monitoring biodiversity, nighttime noise and light levels. Monitoring should be done in accordance with the *Northeast Swale Resource Management Plan* (Meewasin Valley Authority, 2013).
16. **Ensure bylaws are in place for protection of the Swale and the enforcement of prohibited and restricted uses.**
17. **Develop and maintain strong, active partnerships with volunteers and support groups.** Active and ongoing conservation and education are critical for the Swale's long-term survival. Besides participation from provincial, municipal, conservation and education partners, a strong volunteer component is important and must engage the community's sense of ownership. Volunteers could include, for example, local community associations, service groups, clubs and non-profit organizations.

Going Forward

18. Communication Plan

- a. **Engagement with adjacent neighbours and residents.** Provide education materials to neighbouring residents to encourage stewardship and foster an understanding of the importance of the Swale.
- b. **Marketing and Visual Identification.** Create a concise and consistent message for the Swale.
- c. **Coordinate external communication.** Improve communication protocol.
- d. **Develop a central depository for information.** A central body to distribute information and data collected on the Swale for public use.

19. Education Plan

- a. **Curriculum development.**
- b. **Further develop site interpretation.**

20. **Explore the potential for designation of the Swale as a Municipal Heritage site.** *The Heritage Property Act* provides for the preservation, interpretation, and development of heritage resources in Saskatchewan. Any building, structure, or site that is significant for its cultural, historical, architectural, environmental, archaeological, paleontological, scientific, or aesthetic value may be designated as heritage property. A heritage designation would provide protection of the site and bring attention and awareness to the value of the Swale and its unique attributes.

21. **Explore the potential for scaling the ideas within the *Meewasin Northeast Swale Master Plan* to current and future Meewasin sites.** Meewasin's jurisdiction includes many natural areas that would benefit from similar planning and management.

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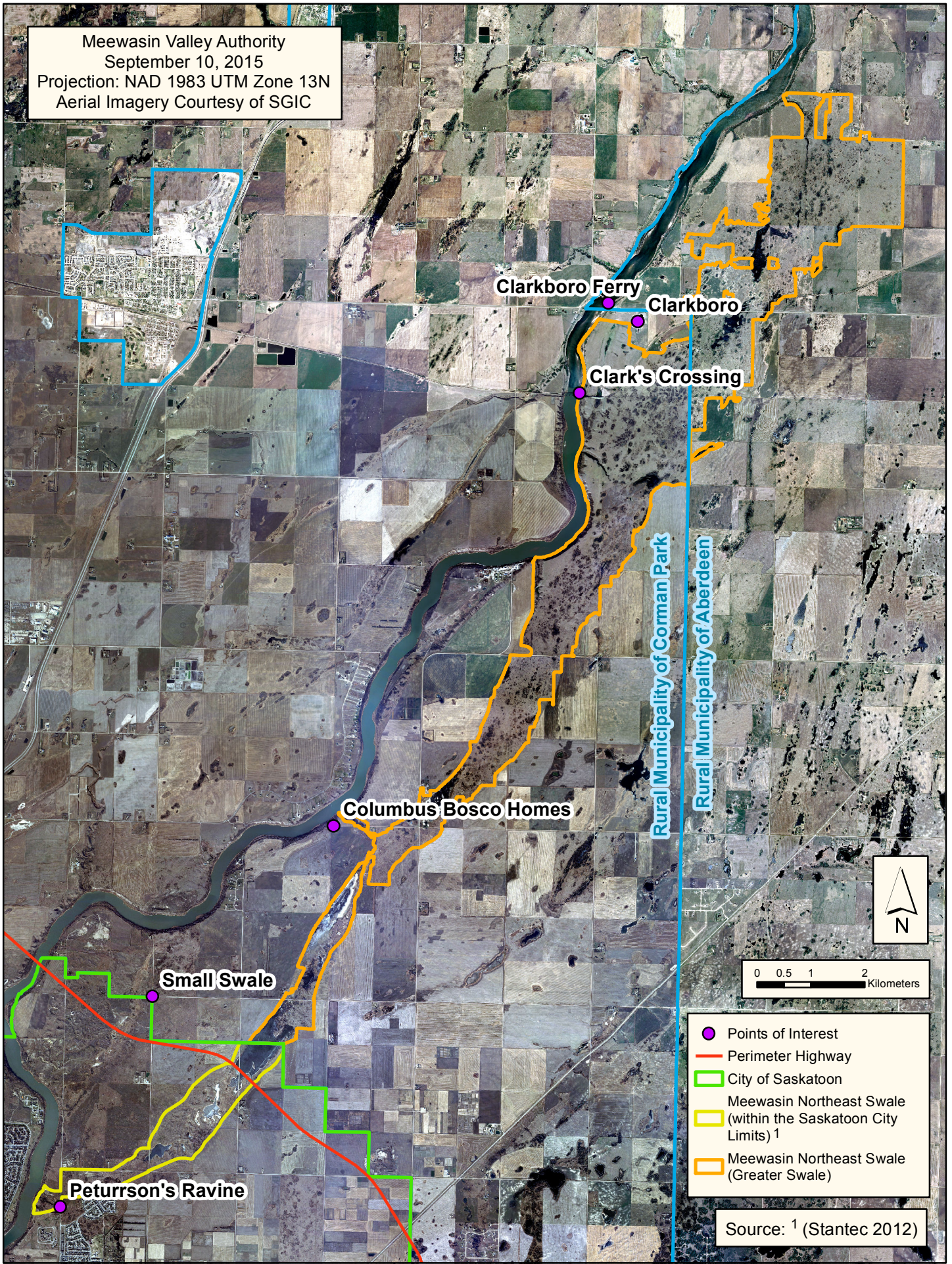
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Appendix A – Figures and Maps

Figure A-1. The Meewasin Northeast Swale Extent

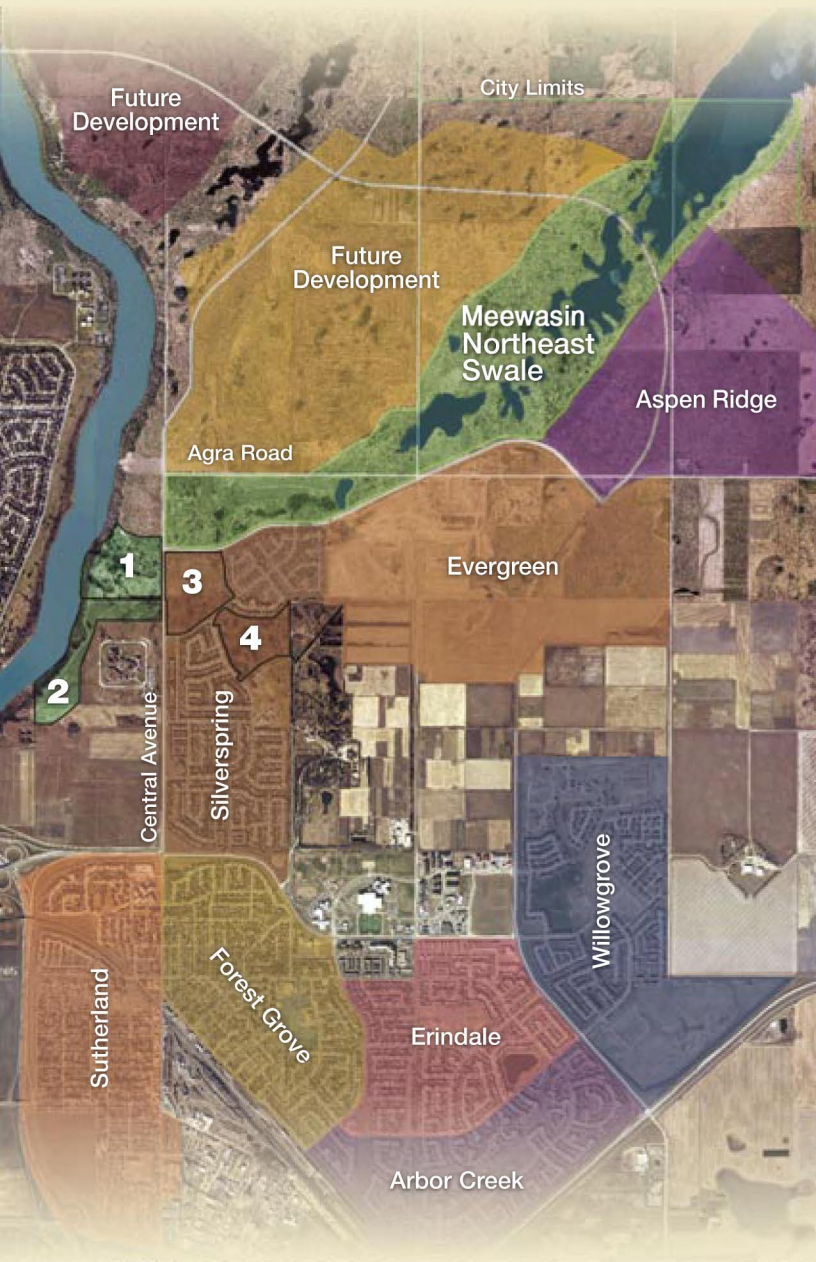


Meewasin Valley Authority
 September 10, 2015
 Projection: NAD 1983 UTM Zone 13N
 Aerial Imagery Courtesy of SGIC

- Points of Interest
- Perimeter Highway
- City of Saskatoon
- Meewasin Northeast Swale (within the Saskatoon City Limits) 1
- Meewasin Northeast Swale (Greater Swale)

Source: 1 (Stantec 2012)

Figure A-2. Meewasin Northeast Swale Location Map



1. Peturrson's Ravine
2. Crocus Prairie
3. University of Saskatchewan Reclamation Site
4. Saskatoon Natural Grasslands

0 250 500 1,000
Meters

Aerial imagery courtesy of the City of Saskatoon and the Saskatchewan Geospatial Imagery Collaborative



Figure A-3. Meewasin Valley Authority Jurisdictional Boundaries (from the *Northeast Swale Resource Management Plan, 2013*)

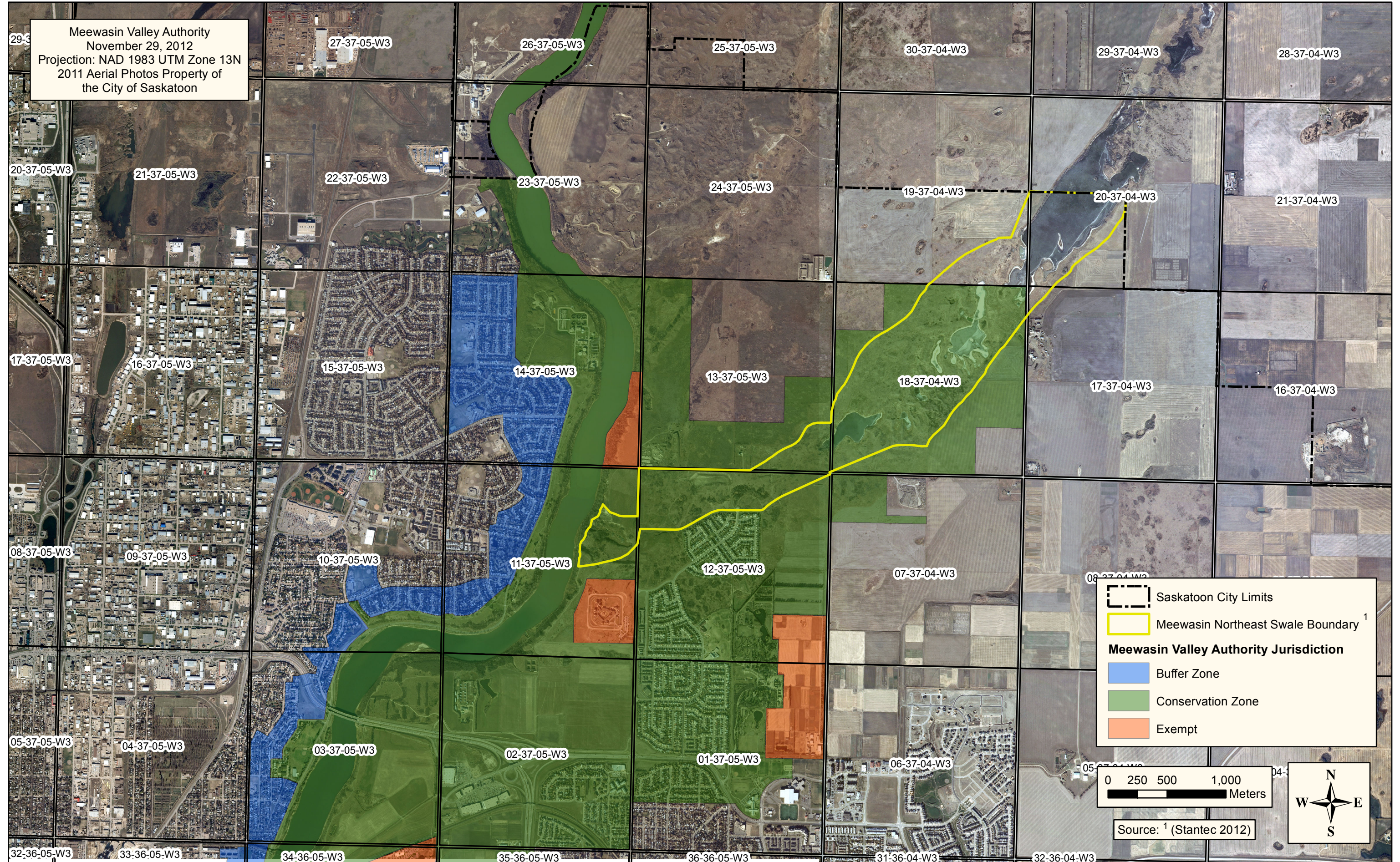


Figure A-4. Conceptual Design

Meewasin Northeast Swale Master Plan
July 28, 2015

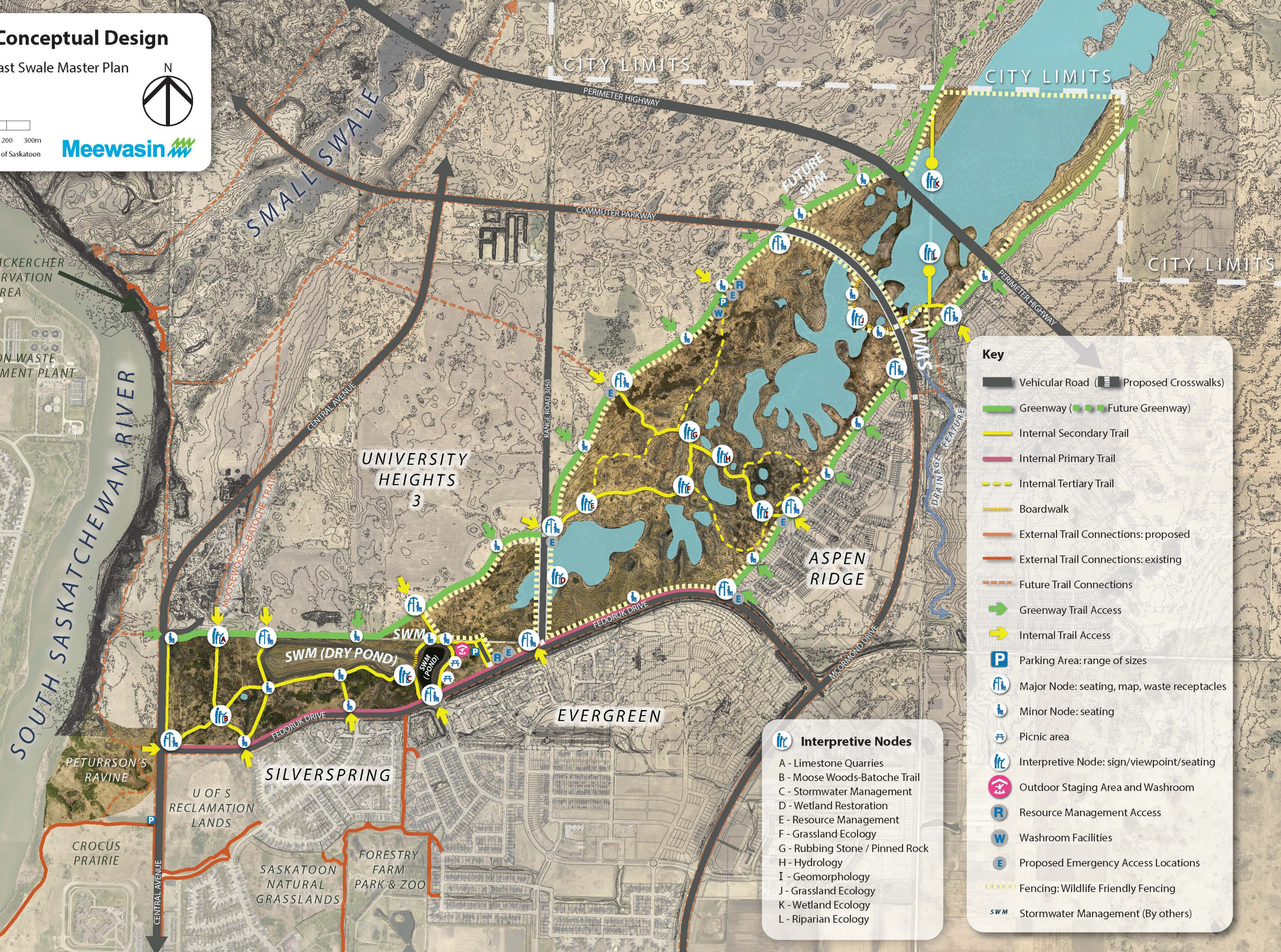
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Scale: 1:7500



0 50 100 200 300m



2013 Aerial Imagery Courtesy of City of Saskatoon



Key

- Vehicular Road (Proposed Crosswalks)
- Greenway (Future Greenway)
- Internal Secondary Trail
- Internal Primary Trail
- Internal Tertiary Trail
- Boardwalk
- External Trail Connections: proposed
- External Trail Connections: existing
- Future Trail Connections
- Greenway Trail Access
- Internal Trail Access
- Parking Area: range of sizes
- Major Node: seating, map, waste receptacles
- Minor Node: seating
- Picnic area
- Interpretive Node: sign/viewpoint/seating
- Outdoor Staging Area and Washroom
- Resource Management Access
- Washroom Facilities
- Proposed Emergency Access Locations
- Fencing: Wildlife Friendly Fencing
- Stormwater Management (By others)

Interpretive Nodes

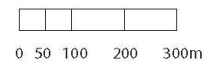
- A - Limestone Quarries
- B - Moose Woods-Batoche Trail
- C - Stormwater Management
- D - Wetland Restoration
- E - Resource Management
- F - Grassland Ecology
- G - Rubbing Stone / Pinned Rock
- H - Hydrology
- I - Geomorphology
- J - Grassland Ecology
- K - Wetland Ecology
- L - Riparian Ecology

Figure A-5. Simplified Concept

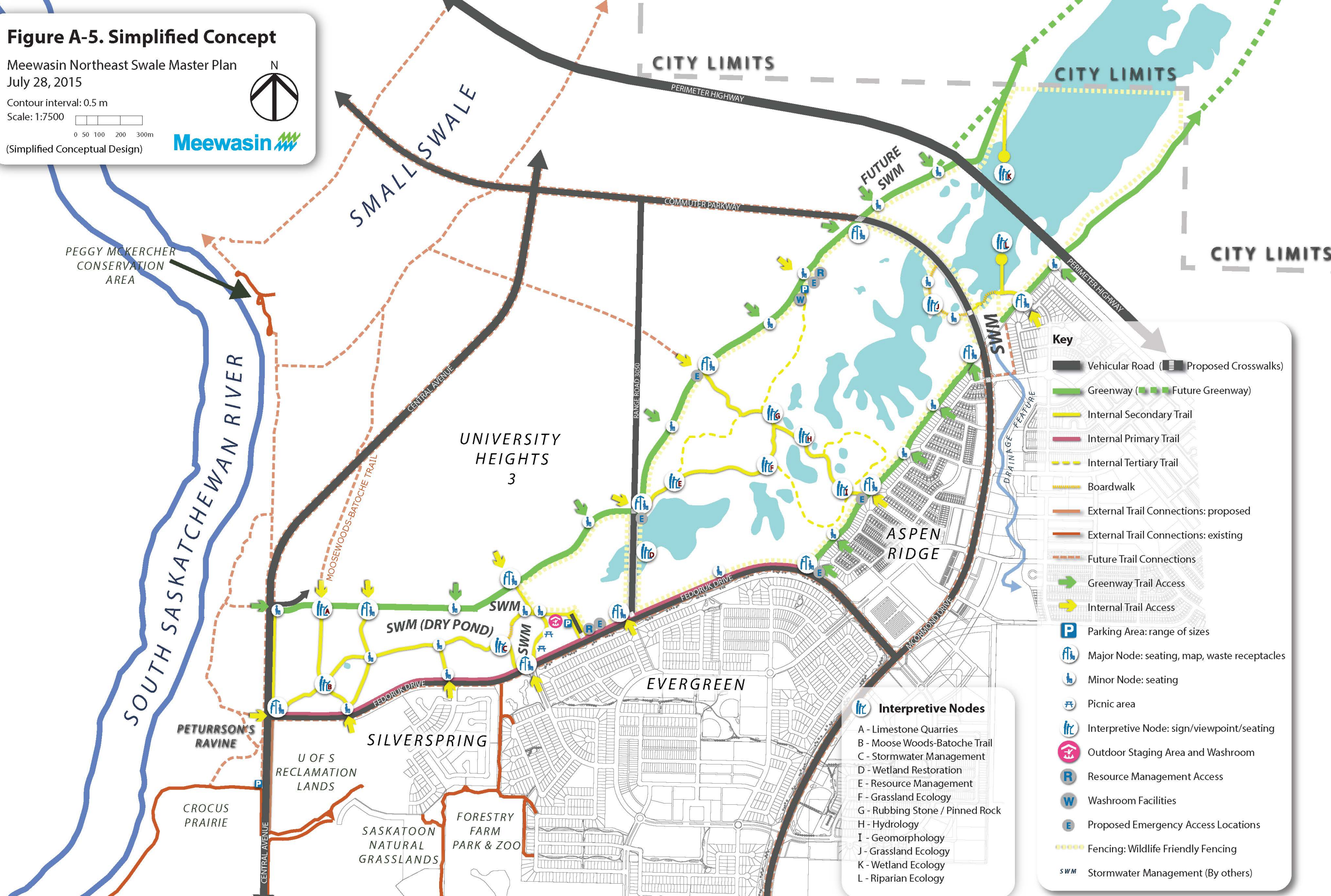
Meewasin Northeast Swale Master Plan
July 28, 2015

Contour interval: 0.5 m

Scale: 1:7500



(Simplified Conceptual Design)



Key

- Vehicular Road
- Proposed Crosswalks
- Greenway
- Future Greenway
- Internal Secondary Trail
- Internal Primary Trail
- Internal Tertiary Trail
- Boardwalk
- External Trail Connections: proposed
- External Trail Connections: existing
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- G - Rubbing Stone / Pinned Rock
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- I - Geomorphology
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- K - Wetland Ecology
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Figure A-6. Meewasin Northeast Swale Master Plan Site Design Program

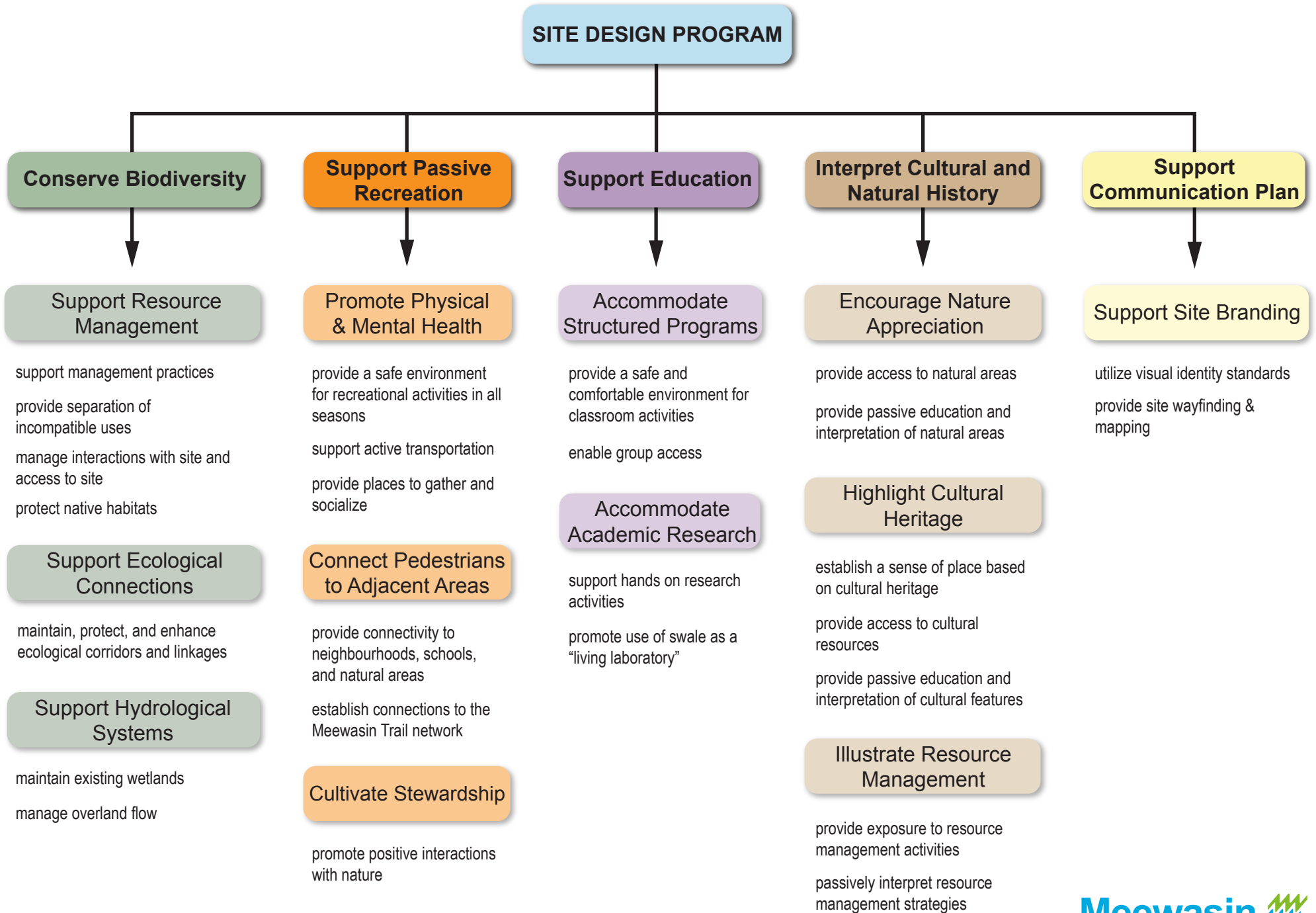


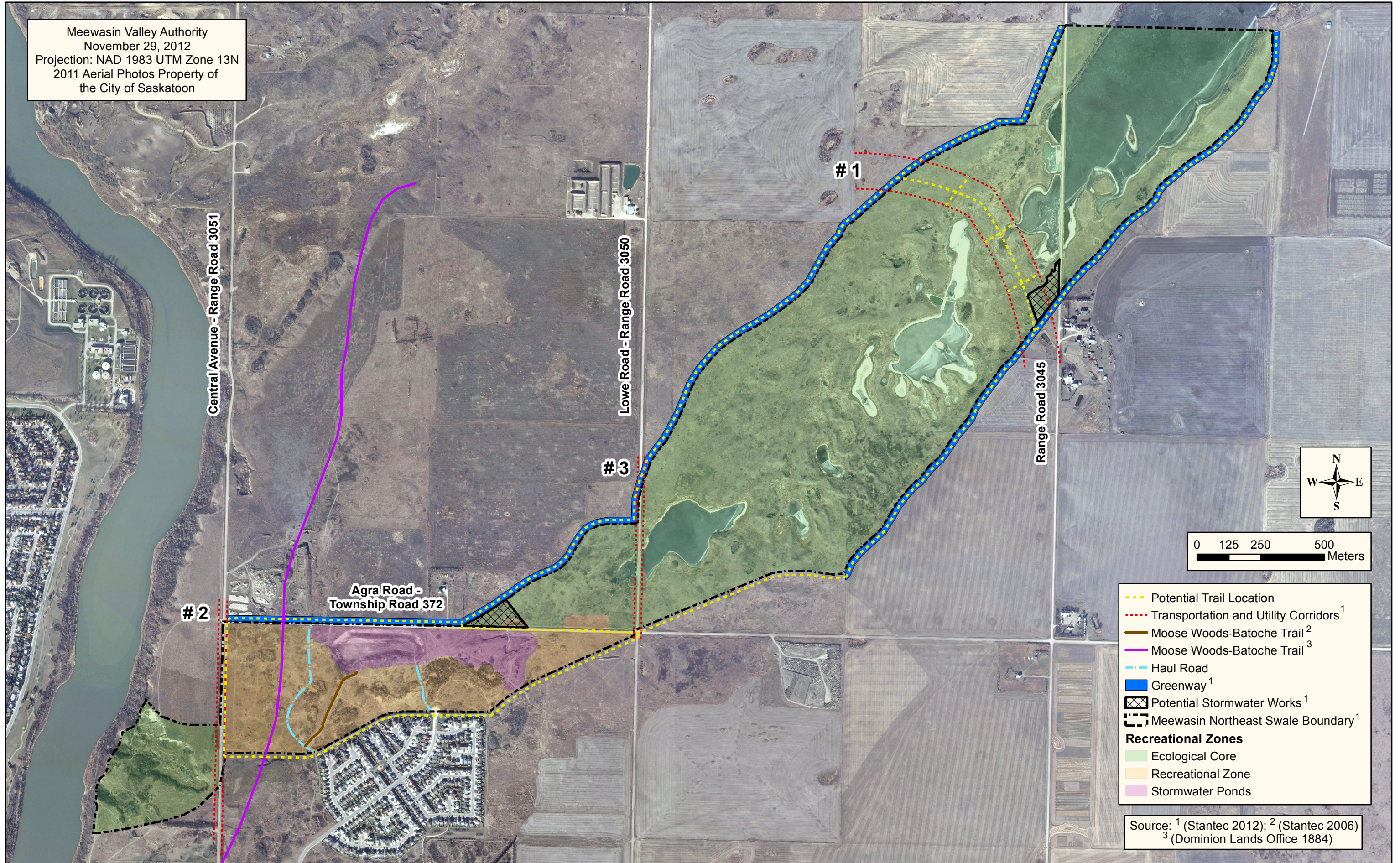
Figure A-7. The Meewasin Northeast Swale Master Plan Design Program Matrix

Feature	Conserve Biodiversity						Support Passive Recreation						Support Education				Interpret Cultural and Natural History						Support Communications Plan							
	Support Resource Management			Support Ecological Connections			Support Hydrological Systems			Promote Physical and Mental Health			Connect Pedestrians to Adjacent Areas			Cultivate Stewardship		Accommodate Structured Programs		Accommodate Academic Research		Encourage Nature Appreciation		Highlight Cultural Heritage			Illustrate Resource Management		Support Site Branding	
	support management practices	provide separation of incompatible uses	manage site access	protect native habitats	maintain, protect and enhance ecological corridors and linkages	maintain wetlands	manage overland flow	provide a safe environment for recreational activities in all seasons	support active transportation	provide gathering places	provide connectivity to neighbourhoods, schools and natural areas	establish connections to Meewasin Trail network	promote positive interactions with nature	provide a safe and comfortable environment for classroom activities	enable group access	support hands on research activities	promote use of Swale as a "living laboratory"	access to natural areas	passive education and interpretation of natural areas	establish a sense of place based on cultural heritage	access to cultural resources	passive education and interpretation of cultural features	exposure to resource management activities	passively interpret resource management strategies	utilize visual identity standards	site wayfinding and mapping				
Greenway		X	X	X	X		X	X	X	X	X	X	X	X			X	X		X	X		X	X	X	X				
Greenway Access Points							X	X		X		X		X			X	X		X		X	X	X	X					
Fencing - Wildlife Friendly	X	X	X	X	X		X					X						X				X	X							
Fencing - Access Control Gates	X	X	X	X								X					X	X				X	X	X	X					
Fencing - Resource Management Gates	X	X	X	X								X				X						X	X							
Fencing - Emergency Service Access	X	X	X	X								X										X	X	X	X					
Outdoor Education Staging Area with Washroom	X						X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X					
Parking Lots			X				X		X				X	X	X	X	X	X		X					X					
Secondary Washroom	X			X		X	X	X	X				X	X	X	X	X	X							X					
Picnic Areas							X		X			X	X	X			X	X							X					
Trail - Greenway		X	X				X	X	X	X	X	X	X	X			X	X		X	X	X	X							
Trails - In Recreation Zone / Fedoruk			X	X			X	X	X	X		X	X				X	X	X	X	X	X	X							
Trails - In Ecological Core (Secondary)		X	X	X			X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X							
Trails - In Ecological core (Tertiary)				X			X		X	X		X	X	X	X	X	X	X				X	X							
Trails - External Connections							X	X	X	X	X	X	X	X			X	X		X					X					
Boardwalks			X	X		X	X	X	X			X	X	X	X	X	X	X							X					
Node - Minor Seating							X	X	X			X	X				X	X				X	X	X						
Node - Interpretive							X	X	X			X	X				X	X	X	X	X	X	X	X	X					
Node - Major							X	X	X			X	X				X	X				X	X	X	X					
Ecological Core	X			X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X					
Recreation Zone	X			X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X					

An X indicates when a feature supports a site design program goal (yes or no - not weighted)
 The matrix assumes the full programming potential has been realised on the site.

Figure A-8. Guidelines for Development of the Meewasin Northeast Swale (from the *Northeast Swale Resource Management Plan, 2013*)

Meewasin Valley Authority
 November 29, 2012
 Projection: NAD 1983 UTM Zone 13N
 2011 Aerial Photos Property of
 the City of Saskatoon



- Potential Trail Location
- Transportation and Utility Corridors¹
- Moose Woods-Batoche Trail²
- Moose Woods-Batoche Trail³
- Haul Road
- Greenway¹
- Potential Stormwater Works¹
- Meewasin Northeast Swale Boundary¹
- Recreational Zones**
- Ecological Core
- Recreational Zone
- Stormwater Ponds

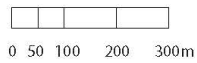
Source: ¹ (Stantec 2012); ² (Stantec 2006)
³ (Dominion Lands Office 1884)

Appendix B – Construction, Costing and Phasing

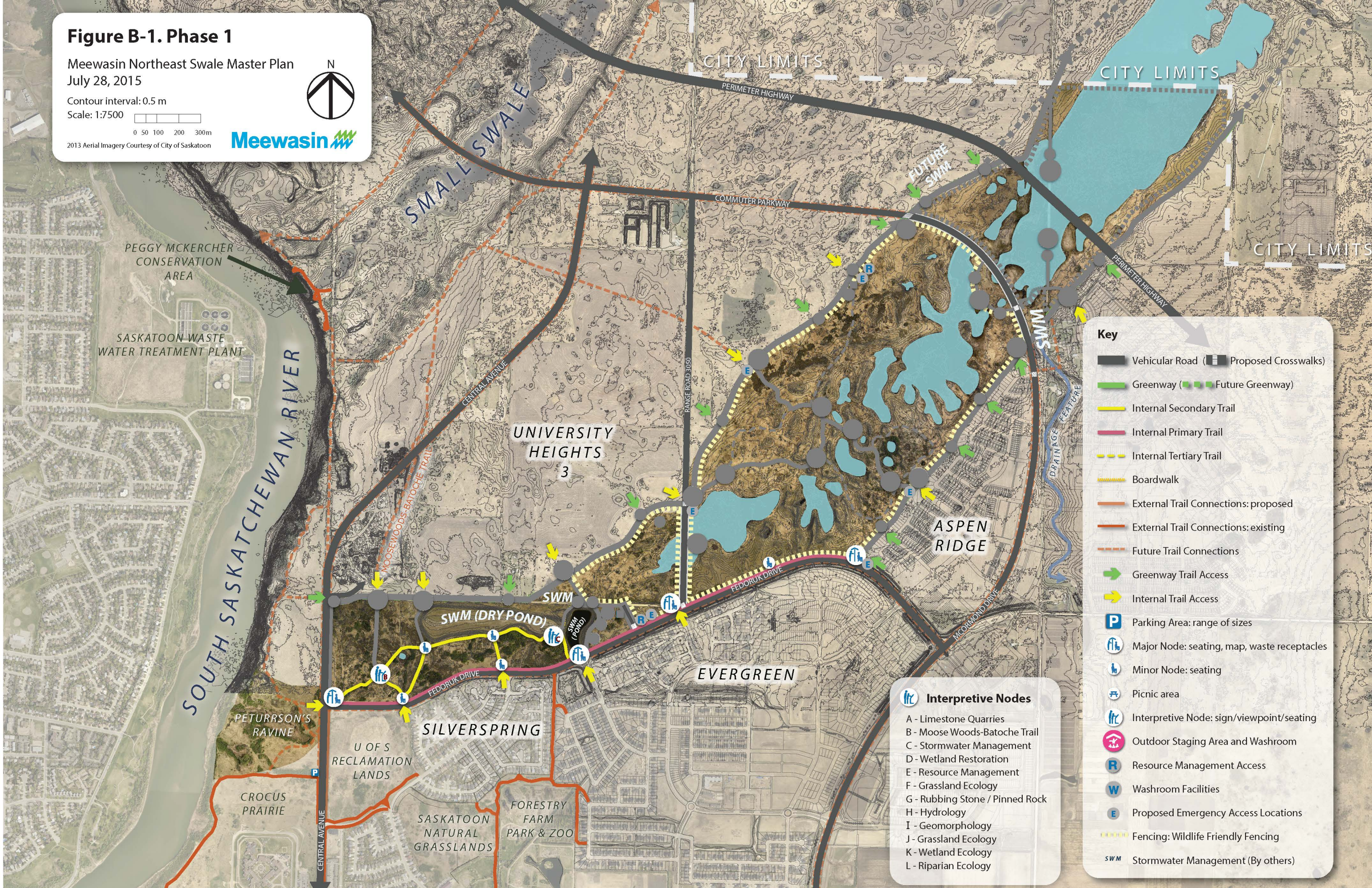
Figure B-1. Phase 1

Meewasin Northeast Swale Master Plan
July 28, 2015

Contour interval: 0.5 m
Scale: 1:7500



2013 Aerial Imagery Courtesy of City of Saskatoon



Key

- Vehicular Road
- Proposed Crosswalks
- Greenway
- Future Greenway
- Internal Secondary Trail
- Internal Primary Trail
- Internal Tertiary Trail
- Boardwalk
- External Trail Connections: proposed
- External Trail Connections: existing
- Future Trail Connections
- Greenway Trail Access
- Internal Trail Access
- Parking Area: range of sizes
- Major Node: seating, map, waste receptacles
- Minor Node: seating
- Picnic area
- Interpretive Node: sign/viewpoint/seating
- Outdoor Staging Area and Washroom
- Resource Management Access
- Washroom Facilities
- Proposed Emergency Access Locations
- Fencing: Wildlife Friendly Fencing
- Stormwater Management (By others)

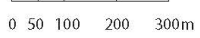
Interpretive Nodes

- A - Limestone Quarries
- B - Moose Woods-Batoche Trail
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- D - Wetland Restoration
- E - Resource Management
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- I - Geomorphology
- J - Grassland Ecology
- K - Wetland Ecology
- L - Riparian Ecology

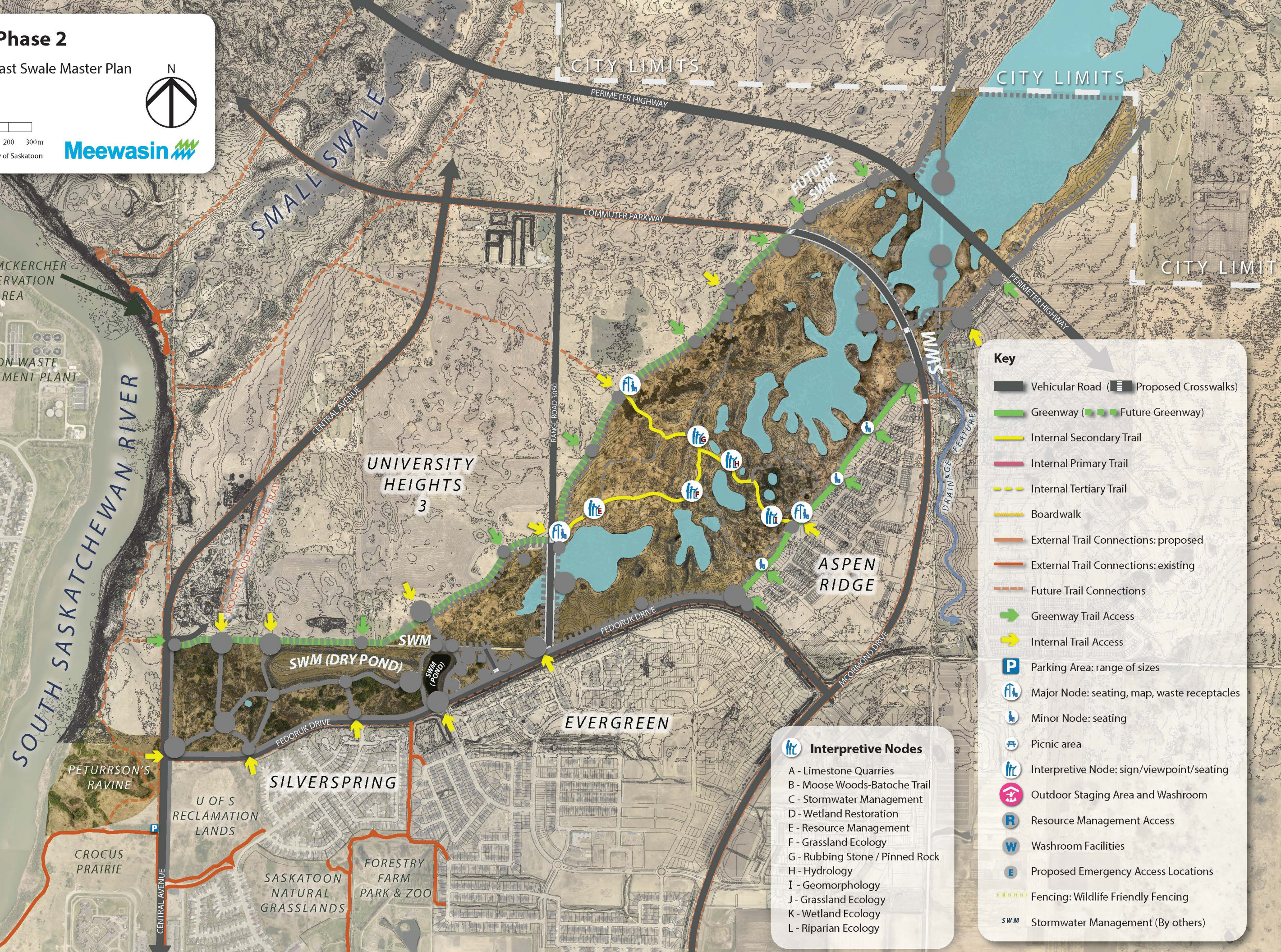
Figure B-2. Phase 2

Meewasin Northeast Swale Master Plan
July 28, 2015

Contour interval: 0.5 m
Scale: 1:7500



2013 Aerial Imagery Courtesy of City of Saskatoon



Key

- Vehicular Road
- Proposed Crosswalks
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- Internal Secondary Trail
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- Stormwater Management (By others)

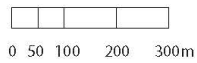
Interpretive Nodes

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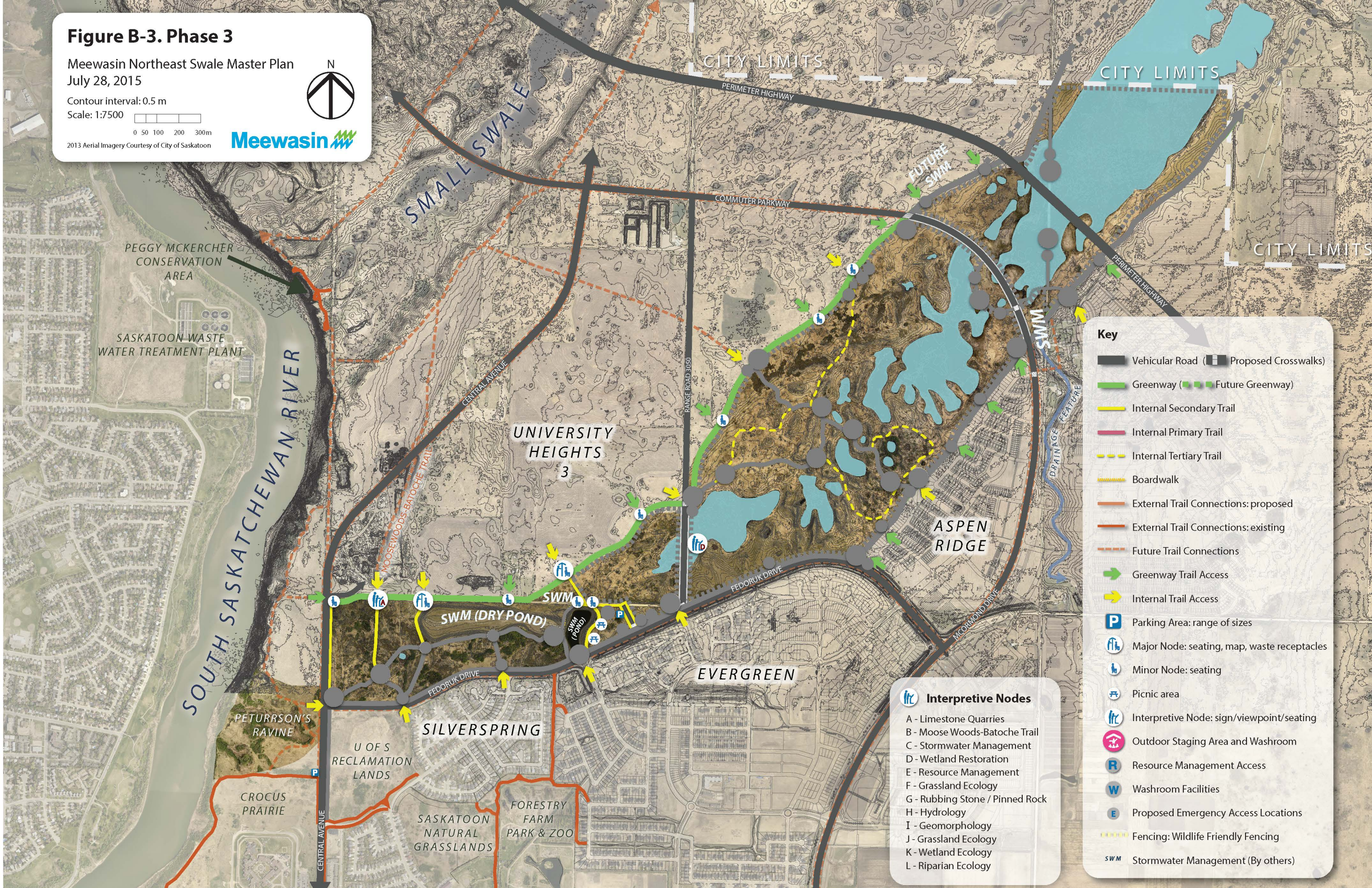
Figure B-3. Phase 3

Meewasin Northeast Swale Master Plan
July 28, 2015

Contour interval: 0.5 m
Scale: 1:7500



2013 Aerial Imagery Courtesy of City of Saskatoon



Key

- Vehicular Road
- Proposed Crosswalks
- Greenway
- Future Greenway
- Internal Secondary Trail
- Internal Primary Trail
- Internal Tertiary Trail
- Boardwalk
- External Trail Connections: proposed
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- Future Trail Connections
- Greenway Trail Access
- Internal Trail Access
- Parking Area: range of sizes
- Major Node: seating, map, waste receptacles
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- Interpretive Node: sign/viewpoint/seating
- Outdoor Staging Area and Washroom
- Resource Management Access
- Washroom Facilities
- Proposed Emergency Access Locations
- Fencing: Wildlife Friendly Fencing
- Stormwater Management (By others)

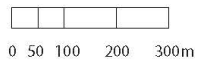
Interpretive Nodes

- A - Limestone Quarries
- B - Moose Woods-Batoche Trail
- C - Stormwater Management
- D - Wetland Restoration
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- F - Grassland Ecology
- G - Rubbing Stone / Pinned Rock
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- K - Wetland Ecology
- L - Riparian Ecology

Figure B-4. Phase 4

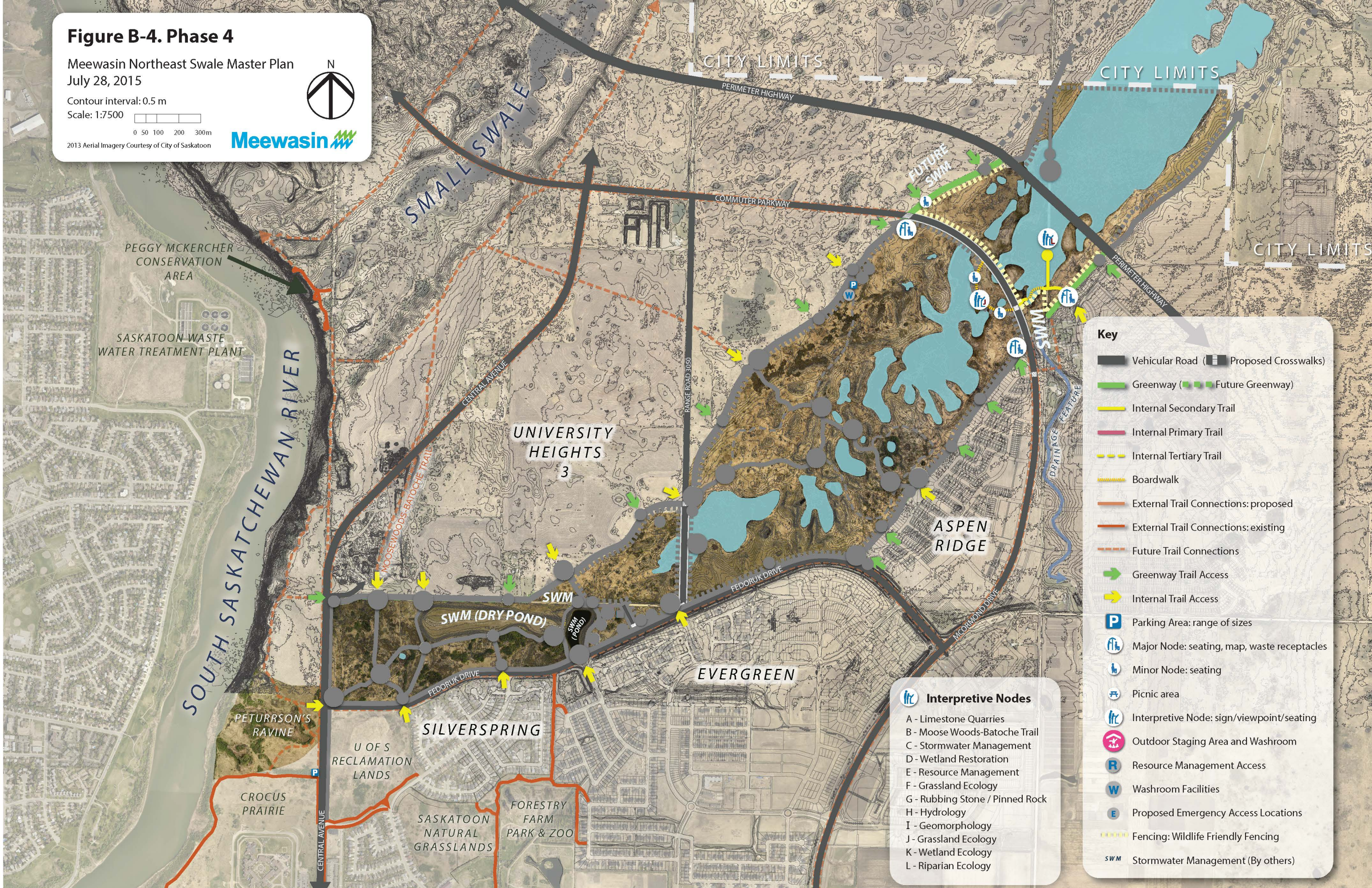
Meewasin Northeast Swale Master Plan
July 28, 2015

Contour interval: 0.5 m
Scale: 1:7500



Meewasin

2013 Aerial Imagery Courtesy of City of Saskatoon



Key

- Vehicular Road
- Proposed Crosswalks
- Greenway
- Future Greenway
- Internal Secondary Trail
- Internal Primary Trail
- Internal Tertiary Trail
- Boardwalk
- External Trail Connections: proposed
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- Greenway Trail Access
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- Major Node: seating, map, waste receptacles
- Minor Node: seating
- Picnic area
- Interpretive Node: sign/viewpoint/seating
- Outdoor Staging Area and Washroom
- Resource Management Access
- Washroom Facilities
- Proposed Emergency Access Locations
- Fencing: Wildlife Friendly Fencing
- Stormwater Management (By others)

Interpretive Nodes

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- B - Moose Woods-Batoche Trail
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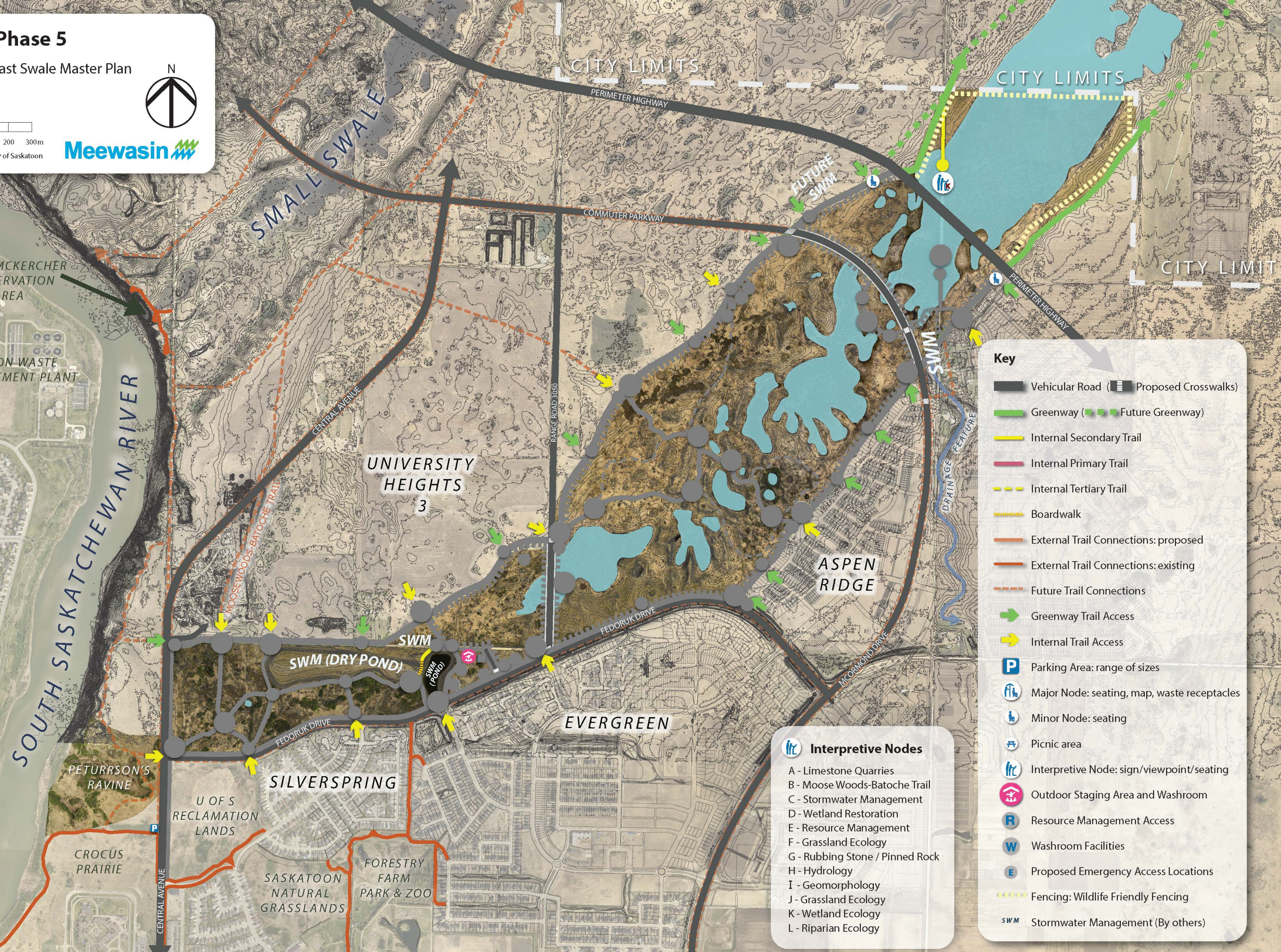
Figure B-5. Phase 5

Meewasin Northeast Swale Master Plan
July 28, 2015

Contour interval: 0.5 m
Scale: 1:7500



2013 Aerial Imagery Courtesy of City of Saskatoon



Key

- Vehicular Road
- Proposed Crosswalks
- Greenway
- Future Greenway
- Internal Secondary Trail
- Internal Primary Trail
- Internal Tertiary Trail
- Boardwalk
- External Trail Connections: proposed
- External Trail Connections: existing
- Future Trail Connections
- Greenway Trail Access
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- Minor Node: seating
- Picnic area
- Interpretive Node: sign/viewpoint/seating
- Outdoor Staging Area and Washroom
- Resource Management Access
- Washroom Facilities
- Proposed Emergency Access Locations
- Fencing: Wildlife Friendly Fencing
- Stormwater Management (By others)

Interpretive Nodes

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- G - Rubbing Stone / Pinned Rock
- H - Hydrology
- I - Geomorphology
- J - Grassland Ecology
- K - Wetland Ecology
- L - Riparian Ecology

Figure B-6 Meewasin Northeast Swale Master Plan - Overall Capital Cost Opinion

*Phasing	Description (See Figures B-1 to B-5 for more detail)	Capital (Swale)	Capital (Greenway)	**Optional Maintenance (1YR Beyond FAC)
Phase1	<ul style="list-style-type: none"> Fence the Ecological Core Trail along south edge of the Swale adjacent to Fedoruk Drive Trail connection along Central Avenue Meewasin Trail Trails within the Recreation Zone Resource Management and emergency services access points (north and south) Interpretive and seating (major/minor) nodes in the the Recreation Zone and Ecological Core 	\$ 2,434,079.70	No Greenway Development Phase 1	\$ 50,000.00
Phase2	<ul style="list-style-type: none"> South Greenway along Aspen Ridge neighbourhood Mow north Greenway bordering University Heights 3 neighbourhood Internal secondary trail in the Ecological Core from Interpretive nodes in the Ecological Core along the secondary trails (east-west / north-south) Major seating nodes adjacent to the secondary trails (east-west / north-south) in the Ecological Core Minor Seating nodes adjacent to Aspen Ridge neighbourhood 	\$ 522,007.20	\$ 1,459,200.00	\$ 50,000.00
Phase3	<ul style="list-style-type: none"> North Greenway Trails in Recreation Zone Internal tertiary trails in the Ecological Core Interpretive and seating (major/minor) nodes between Central Avenue and North Commuter Parkway Parking for Outdoor Education Staging Area Trail along Central Avenue, north of Fedoruk Drive to University Heights 3 Picnic areas 	\$ 1,205,907.75	\$ 3,964,800.00	\$ 50,000.00
Phase4	<ul style="list-style-type: none"> Fencing between the North Commuter Parkway and Perimeter Highway Greenway between the North Commuter Parkway and Perimeter Highway Feature lookout from the North Commuter Parkway in the Ecological Core Trail development Interpretive and seating (major/minor) nodes along the feature lookout and internal trails North washroom North parking lot 	\$ 1,118,650.50	\$ 1,190,400.00	\$ 50,000.00
Phase5	<ul style="list-style-type: none"> Fencing from Perimeter Highway to City limits Greenway from Perimeter Highway to City limits Boardwalk in Recreation Zone Outdoor Education Staging Area Trail along Range Road 3045, between Perimeter Highway and City limits Interpretive node between Perimeter Highway and City limits Seating nodes (minor) along Perimeter Highway 	\$ 797,502.24	\$ 1,344,000.00	\$ 50,000.00
Total		\$ 6,078,147.39	\$ 7,958,400.00	\$ 250,000.00

* Currently there is no scheduled timeline for the start of construction, and therefore work is set out in phases rather than distributed over years.

** It is recommended that construction maintenance be continued one year post FAC after which time the City would assume maintenance operations

Note: this is based on the concept plan and is subject to change during detail design

Figure B-6 Meewasin Northeast Swale Master Plan - Ongoing Operational Costs

*Phasing	*Resource Management	Communication Plan	Education Plan	Operating Budget (By others)
Year 1	\$ 186,443.00	\$ 15,000.00	\$ 50,000.00	
Year 2	\$ 134,400.00	\$ 15,000.00	\$ 60,000.00	
Year 3	\$ 144,240.00	\$ 15,000.00		
Year 4	\$ 147,543.00	\$ 15,000.00		
Year 5	\$ 165,125.00	\$ 15,000.00		
Total	\$ 777,751.00	\$ 75,000.00	\$ 110,000.00	\$ -

* Resource management costs are not affected by construction, and therefore this work can begin as early as 2016. These are annual costs for a five year period.

Note: this is based on the concept plan and is subject to change during detail design

Figure B-7. Meewasin Northeast Swale Construction Phases

Quantity Matrix

Features	Greenway (acres)	Greenway Lighting (each)	Primary Trails (l.m.) (Asphalt)	Secondary Trails (l.m.) (Crusher Dust)	Tertiary Trails (l.m.) (Mown)	Boardwalk with railing (l.m.)	Wildlife Friendly Fencing (l.m.)	Resource Management Access (each)	Emergency Services Access (each)	Benches (each)	Trash Unit (each)	Trail Wayfinding Maps (each)	Secondary Trail Wayfinding Maps (each)	Picnic Tables (each)	Picnic Shelter (each)	Interpretive Sign (each)	Parking Lot (sq m)	Bollards (Timber /Knock Down)	Washroom	Outdoor Education Staging Area
Phase 1																				
Greenway (Storm water / trails / planting / lighting)																				
Recreation Zone				2566														5		
Ecological Core							7550	2	6											
Trail Widening (Fedoruk Road)			2570																	
Trails outside the Swale			475																	
Major Seating Nodes (4)										8	4	3	1							
Minor Seating Nodes (5)										10			3							
Interpretive Nodes (2)										2						2				
<i>Subtotal</i>			3045	2566			7550	2	6	20	4	3	4			2				
Phase 2																				
Greenway (Storm water / trails / planting / lighting)	8	42	1250		1250															
Recreation Zone																				
Ecological Core				2080																
Major Seating Nodes (3)										6	2	2								
Minor Seating Nodes (3)										6			3							
Interpretive Nodes (5)										5						5				
<i>Subtotal</i>	8	42	1250	2080						17	2	2	3			5				
Phase 3																				
Greenway (Storm water / trails / planting / lighting)	21	116	3500																	
Recreation Zone			485	1450													1600	80		
Ecological Core					1275															
Major Seating Nodes (2)										4	2	2								
Minor Seating Nodes (8)										16	5		3							
Interpretive Nodes (2)										2						2				
Picnic Nodes (2)											2			4	1					
<i>Subtotal</i>	21	116	3985	1450	1275					22	9	2	3	4	1	2	1600			
Phase 4																				
Greenway (Storm water / trails / planting / lighting)	6	35	1055																	
Recreation Zone																				
Ecological Core				150		450	1600		1								800	40	1	
Major Seating Nodes (3)										6	3	3								
Minor Seating Nodes (3)										5	2									
Interpretive Nodes (2)										2						2				
<i>Subtotal</i>	6	35	1055	150		450	1600		1	13	5	3	0			2	800		1	
Phase 5																				
Greenway (Storm water / trails / planting / lighting)	7	38	1140																	
Recreation Zone				74		100														
Ecological Core						250	2090	1											1	1
Major Seating Nodes																				
Minor Seating Nodes (2)										4	2		2							
Interpretive Nodes (1)										1						1				
Facility																				
<i>Subtotal</i>	7	38	1140	74		350	2090			5			2						1	1
TOTALS (ALL PHASES COMBINED)	42	231	10475	6320	1275	800	11240	2	7	77	20	10	12	4	1	11	2400		2	1

* Note: this is based on the concept plan and is subject to change during detail design

Appendix C – Terms of Reference for the Meewasin Northeast Swale Master Plan

Terms of Reference for

Northeast Swale Master Plan
Meewasin Valley Authority

Meewasin Valley Authority
April 23, 2014

TERMS OF REFERENCE

1. OVERVIEW

Meewasin is proposing to prepare a Master Plan for the Northeast Swale to plan and design the physical space, including pathways and amenities, within the Northeast Swale. The plan will support resource management, education and recreation uses consistent with the *Northeast Swale Resource Management Plan* and the *Northeast Swale Development Guidelines* (Stantec, 2012).

2. BACKGROUND

Saskatoon's Northeast Swale is an ancient river channel. It begins at Peturrson's Ravine and carves a 26 km long path adjacent to the South Saskatchewan River. It is one of the largest pieces of unbroken prairie, riparian forest and wetlands in the Saskatoon region with patches of rare fescue grassland. The swale is home to several rare and endangered and culturally significant plant and animal species.

The Northeast Swale and the Greater Swale has signs of human habitation and use over the past several centuries, including a remnant section of the Moose Woods-Batoche Trail, Middleton's staging camp on the on the trek to the Battle of Batoche, the site of the telegraph line that linked North America to Europe by way of Russia, and tipi rings from the encampments of the original residents of the Saskatoon area. More recent archeological remains are the lime kilns near the swale and a hole left by the movement of large limestone boulders used to build parts of the University of Saskatchewan.

In 2012, Meewasin collaborated with the City of Saskatoon and a wide variety of stakeholders throughout the community to develop a plan to integrate this sensitive natural area into an urban context. The *Northeast Swale Resource Management Plan* includes appropriate passive recreational activities, education and research opportunities. It also describes management techniques appropriate to a natural area including burning and grazing to manage invasive species and protect and enhance biodiversity.

The *Northeast Swale Development Guidelines (2012)*, a companion document, is intended to ensure minimal impact from development within and adjacent to it. Meewasin played a key role in its development working with the City of Saskatoon, a consultant and experts from the community. The Guidelines have been adopted by both Meewasin Board of Directors and Saskatoon City Council.

3. SCOPE OF WORK

Meewasin requires the following work to be completed as part of this project:

- Establishment of Steering and Technical Committees and planning for stakeholder involvement to support the development of the plan;
- Coordination and facilitation of 8 meetings with the Technical Advisory Committee, 4 meetings with the Steering Committee and multiple meetings with stakeholder groups as required.
- Planning and execution of full day design charrette, resulting in the development of document summarizing the results of the charrette. A presentation of the design options resulting from the charrette will be given to the Technical Advisory Committee to provide guidance for finalization.
- Development of a comprehensive site plan for the Northeast Swale. The plan must outline improvements in the ecological core and the greenway and include site design drawings. It must consider adjacent uses and access management and describe the rationale and intent of design features.
- Presentation of a draft site plan to the Meewasin Management Team, Meewasin Advisory Committees, and to the Meewasin Board of Directors.
- Development of communications and branding strategy for the Northeast Swale to effectively communicate importance of the swale and the activities taking place there. The strategy will also include a proposed name for the site. An approach to include stakeholder input will be incorporated.
- Development of an implementation appendix that includes cost estimates, funding strategy options for capital construction, an approach for phased construction, and a description of ongoing site maintenance requirements.
- Development of a presentation on the comprehensive site plan, the communications and branding strategy, and the implementation appendix. The presentation will be given to Meewasin committees, the Meewasin Board of Directors, the Planning and Operations Committee at the City of Saskatoon and City council for input and approval.
- The final report and presentation must be completed by February, 2015

4. DELIVERABLES

Report, Drawings and Presentation Material defining the following:

Comprehensive Site Plan:

- Overall site plan and proposed improvements in the ecological core, buffer zones, and recreation zones;
- Greenway and trail design including pathways, site access and connectivity to adjacent land uses adjacent, neighborhoods and crossing features;
- Site grading, drainage and storm water management;
- Amenity design for safety and comfort, including site furniture and signage;
- Site design to support resource management, interpretation and programming;

Education and Communication Strategy:

- Education, interpretation and programming opportunities;
- Communication strategy including naming and branding;

Implementation Appendix:

- Cost estimate for capital construction including quantities and unit costs;
- Proposed funding strategy options for capital construction;
- Implementation plan including proposed phasing;
- Site maintenance plan and recommendations.

5. ROLES

Project Team:

Project Manager	Alan Otterbein
Project Manager	Mike Velonas
Project Designer	Nola Stein
Design Assistant	Jonathan Behnke
GIS Specialist	Sarina Gersher
Project Coordinator	Erin Akins
Interpretive Advisor	Doug Porteous
Special Advisor	Colleen Yates

Steering Committee

City of Saskatoon:	Planning and Development	Alan Wallace
	Recreation and Sport	Cary Humphrey
	Parks	Darren Crilly
	Enviro & Corporate Initiatives	Brenda Wallace
Meewasin:	Saskatoon Land	Frank Long
	Design and Development	Allan Otterbein
	Planning and Conservation	Mike Velonas
	Community Development	Doug Porteous

Technical Advisory Committee

City of Saskatoon:	Long Range Planning	Terry Fusco
	Education and Enviro Performance	Amber Jones

	Land Development	Tyson McShane
	Storm Water Management	Andrew Hildebrandt
	Safe Growth/CPTED	Elisabeth Miller
	Recreation and Sport	Elan Ballantyne
	Parks	Gerald Rees
Meewasin:	Design and Development Manager	Alan Otterbein
	Project Designer	Nola Stein
	Design Assistant	Jonathan Behnke
	Project Coordinator	Erin Akins
	Conservation Officer	Luc Delanoy
	GIS Specialist	Sarina Gersher
	Interpretive Lead	Doug Porteous
	Special Advisor	Colleen Yates
	Conservation Advisory Committee	Peter Goode
Other:	Swale Watcher	Stan Shadick
	Swale Watcher	Barb Hanbridge
	Soil and hydrology specialist	Les Henry
	Metis cultural interpretation	Fiji Robinson
	Saskatoon Heritage Society	Claire Bullaro
	Archeological specialist	Butch Amundson

6. RESPONSIBILITIES – PROJECT TEAM

Project Managers are accountable for:

- 1) Achievement of project milestone and deliverables
- 2) Budgeting and allocation of project resources
- 3) Managing risks and resolving conflicts
- 4) Providing direction to project team and committees
- 5) Obtaining project approval by Meewasin Board and Saskatoon City Council
- 6) Handling all project related media relations

The Project Team is accountable for:

- 1) Coordinating Steering and Technical Committees
- 2) Researching and summarizing relevant information
- 3) Managing project communications and materials
- 4) Planning and implementing stakeholder engagement
- 5) Technical support including GIS, mapping, and design
- 6) Report writing including, content and editing
- 7) Development of the communications and branding strategy
- 8) Being responsive to committee input and direction

7. RESPONSIBILITIES – STEERING COMMITTEE

The Steering Committee will:

- 1) Provide advice and direction to the Project Team on the Master Plan;
 - i. represent their respective organization’s views, ensuring that the plan progresses in a manner consistent with the interests of their organization.
 - ii. Serve as a link to the communities of interest which they represent and ensure that these communities are made aware of the progress on the Master Plan;
 - iii. provide direction with the intention of meeting the goals outlined in the *Northeast Swale Resource Management Plan (2013)* and the *Northeast Swale Development Guidelines (Stantec, 2012)*.
- 2) Undertake initial reviews of major accomplishments and reports prepared by the Meewasin Valley Authority and the Technical Advisory Committee;
- 3) Provide guidance on stakeholder engagement throughout the project;
- 4) Meet on a periodic basis (approximately 4 times), face-to-face, in Saskatoon.

A tentative meeting schedule is proposed as follows but could be revised depending on progress of the project:

Meeting #1	Apr 17, 1:30-3:00 pm
Meeting #2	Jul 15, 1:30-3:00 pm
Meeting #3	Nov 18, 1:30-3:00 pm
Meeting #4	Jan 20, 1:30-3:00 pm

8. RESPONSIBILITIES – TECHNICAL ADVISORY COMMITTEE

The Technical Advisory Committee will:

- 1) Serve as a link to the communities of interest or organizations which they represent and ensure that these communities are made aware of the progress on the Master Plan;
- 2) Bring forward any issues or recommendations to the Project Team and to the Steering Committee based on professional knowledge and expertise;
- 3) Undertake reviews of major reports once they have been vetted by the Steering Committee and provide advice to the Project Team
- 4) Meet on a monthly basis, face-to-face, in Saskatoon.

A tentative meeting dates schedule is proposed as follows but could be revised depending on progress of the project:

Meeting #1	April 16, 1:30-3:00 pm
Meeting #2	June 5, 1:30-3:00 pm
Meeting #3	July 10, 1:30 -3:00 pm
Meeting #4	Aug 28, 1:30-3:00 pm
Meeting #5	Sept 25, 1:30- 3:00 pm
Meeting #6	Oct 30, 1:30-3:00 pm

Meeting #7 Nov 27, 1:30-3:00 pm
 Meeting #8 Jan 15, 1:30- 3:00pm

9. PROJECT MILESTONES

Week of	2014
Mar 17	Confirm committee representation
April 16	Technical Advisory Committee meeting #1
April 17	Steering Committee meeting #1
May- June	Meetings with key stakeholders
June 5	Technical Advisory Committee meeting #2
July 10	Technical Advisory Committee meeting #3
July 15	Steering Committee meeting #2 (Review Preliminary Draft)
Aug 28	Technical Advisory Committee meeting #4
Sept 25	Technical Advisory Committee Meeting #5
Oct 30	Technical Advisory Committee Meeting #6
Oct	Stakeholder meetings and public open house
Nov 18	Steering Committee Meeting #3 (Review 75% draft)
Nov 20	Presentation to Development Review
Nov 27	Technical Advisory Committee meeting #7

Week of	2015
Jan 15	Technical Advisory Committee meeting #8
Jan 20	Steering Committee Meeting #4 (Review Final Draft)
Feb 16	Presentation to Meewasin Development Review Committee Presentation to City of Saskatoon CPTED Committee
Mar 2	Presentation to Meewasin Board for Approval
April	Presentation to City of Saskatoon P&O Committee
April	Presentation to City Council

10. STAKEHOLDER ENGAGEMENT

Phase 1 Engagement (Input): May 1-28

- Workshop sessions with key stakeholders groups

Phase 2 Engagement (Review): October 6-20

- Stakeholder meetings to review 75% draft
- Public open house to seek input on 75% draft
- Draft document is posted online for comment

Stakeholder Groups:

- General Public

- City of Saskatoon:
 - Leisure Facilities (Recreation and Sport)
 - Facilities Maintenance (for park sites)
 - Parks - Maintenance (Naturalization)
 - Parks - Open Space Design
 - Strategic Services (Storm water)
 - Community Development
 - Neighbourhood Services

- RM Corman Park
- Provincial Government – Perimeter Highway Planning

- Environmental: Swale Watchers, Saskatoon Nature Society, Native Plant Society of Saskatchewan, Saskatchewan Environmental Society, Ducks Unlimited, Saskatoon Wildlife Federation
- Recreation: Saskatoon Cycles, Nordic Ski Club, Saskatoon Road Runners Association; Trail Rastas, off-leash dogs and ATV or Snowmobile groups
- Aboriginal: First Nations and Metis
- Education: School boards, University of Saskatchewan, SIAST
- Community Associations: Silverspring, Evergreen, Aspen Ridge, University Heights 3 (UH3)

11. CONTEXT DOCUMENTS

Plans:

The Northeast Swale Resource Management Plan, 2013
The Northeast Swale Development Guidelines, 2012
Meewasin Valley Trail System Plan -1990
Meewasin Valley Interpretive Concept - 1984
The Meewasin Valley Project – 100 Year Conceptual Master Plan, 1981

Policy, legislation, standards and regulations:

The Planning and Development Act, 2007
The Subdivision Regulations
The Statements of Provincial Interest Regulations, 2003
The Weed Control Act
The Environmental Management and Protection Act

The Highways and Transportation Act, 1997
The Meewasin Valley Authority Act

The City of Saskatoon Official Community Plan
The City of Saskatoon Zoning Bylaw
The City of Saskatoon's proposed wetland policy

The Saskatoon Planning District Official Community Plan
The Saskatoon Planning District Zoning Bylaw

New Neighborhood Design and Development Standards Manual, City of Saskatoon
City of Saskatoon Park Development Guidelines and Construction Specifications
University Heights Sector Plan

Meewasin Valley Authority - Northeast Policy

12. BUDGET

Costs associated with developing the Master Plan and design will be assumed by Meewasin.

13. CONFIDENTIALITY

As part of discussions supporting this project, proprietary information may be disclosed. Any unauthorized release or carelessness in the handling of confidential or proprietary information is considered a breach of the duty to maintain confidentiality.