Water Security Agency

SASKATCHEWAN

May 3, 2016

New Approach to Agricultural Water Management

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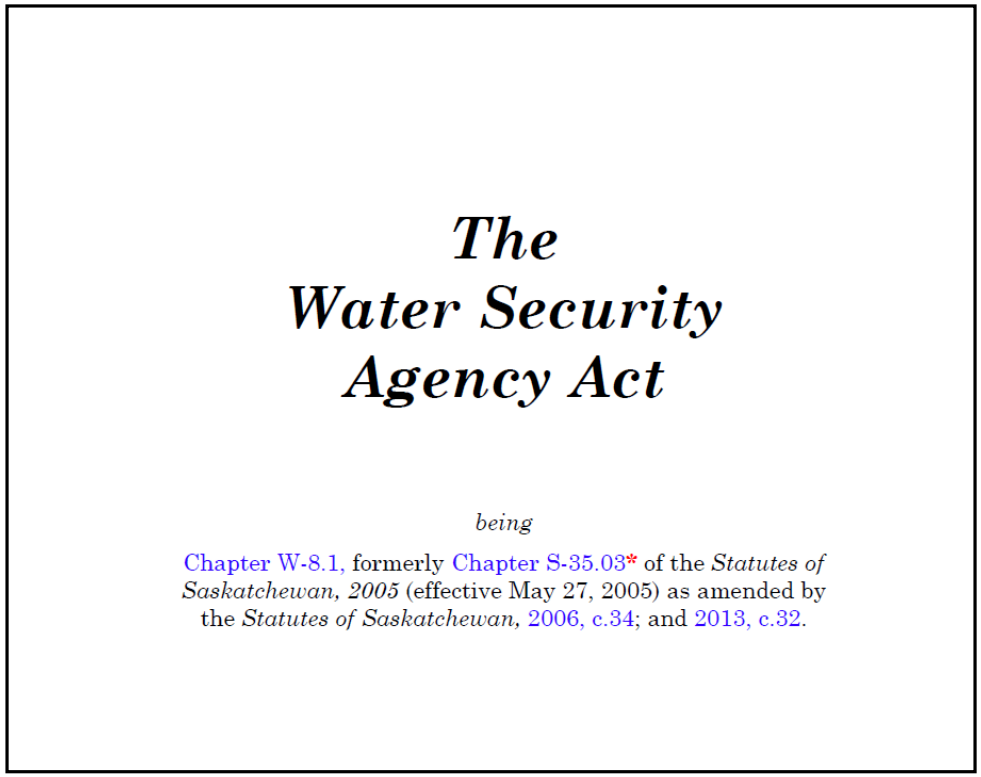
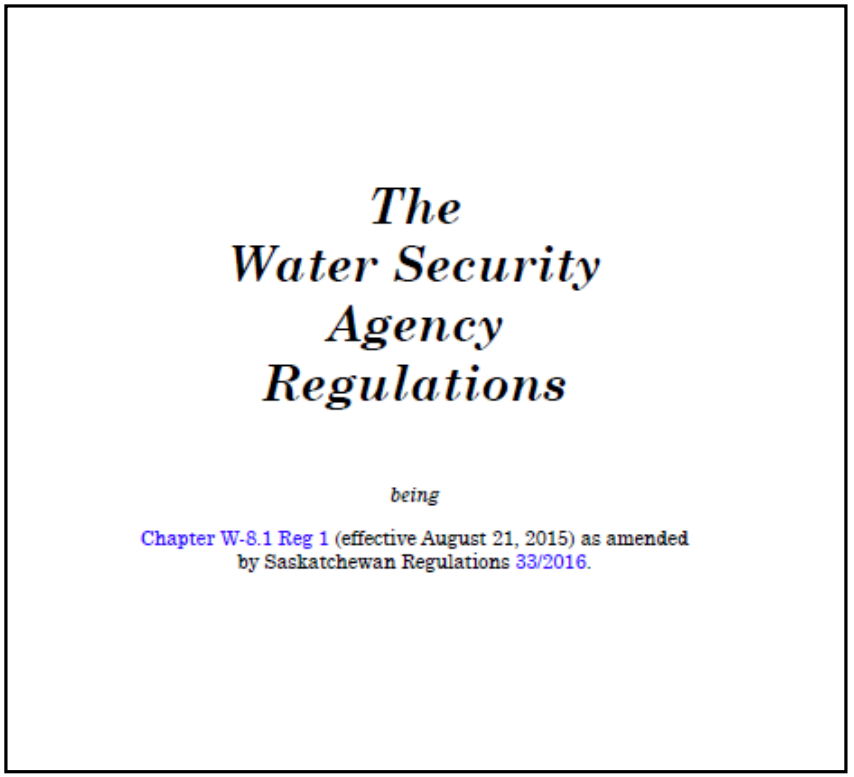
Water Security Agency's New Approach to Agricultural Drainage

1. Regulations, Policy & Legislation
   - Historical Context
   - Current Status
2. Implementation of New Approach
   - Impacts & Risk
   - Mitigation Tools
   - Pilot Projects
3. Challenges & Knowledge Gaps

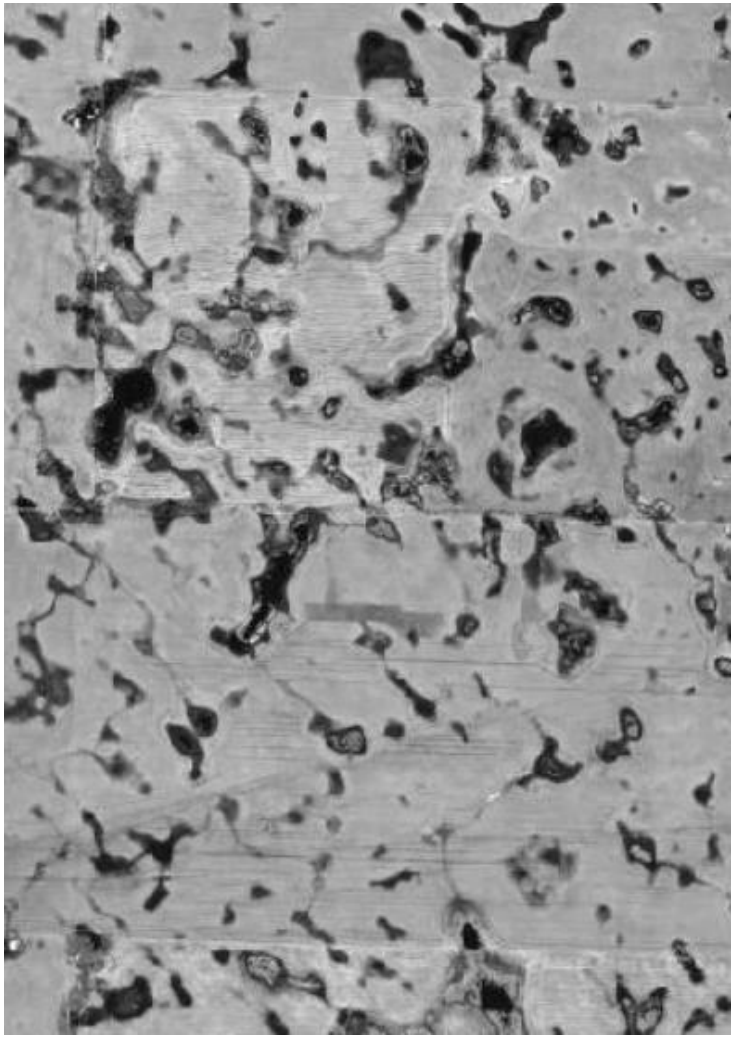




Regulations, Policy & Legislation

Wetland-related Acts and Policy

- *The Water Security Agency Act*
- *Environmental Management and Protection Act, 2010*
- *Conservation and Development Act*
- *Watershed Associations Act*
- Saskatchewan Wetland Policy (mid 90s)

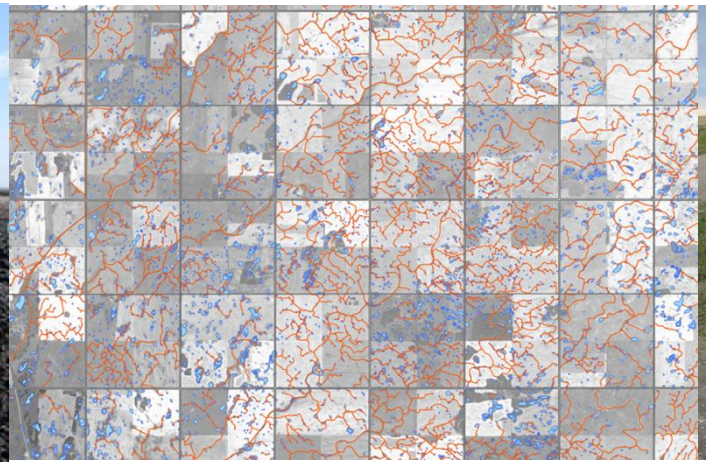


Historic Policy Approach in Saskatchewan

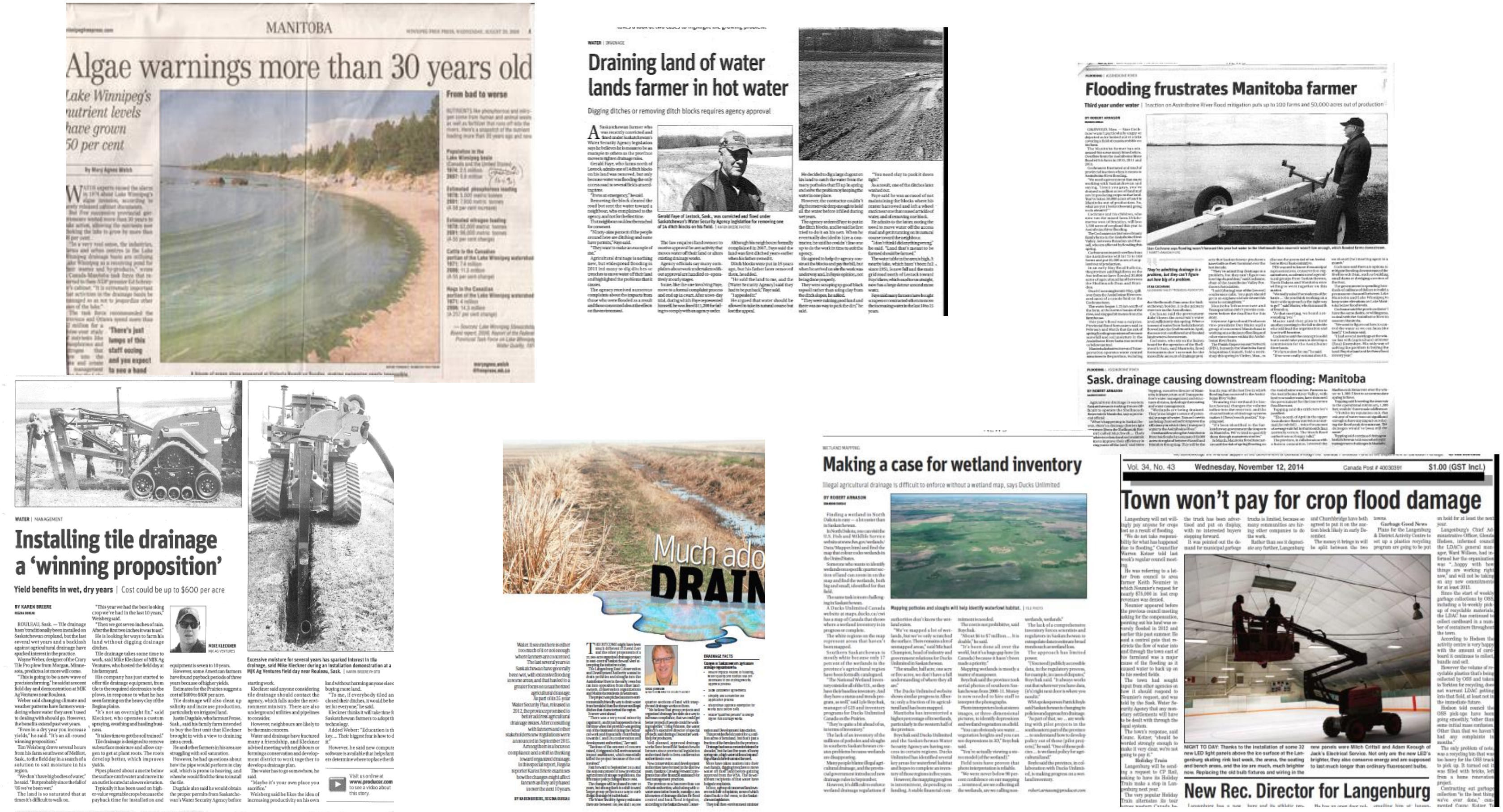
- 1950's-1980's - Provincial government actively promoted drainage through supporting creation of Conservation and Development Areas Authorities
- Since 1981 all new works required an approval but compliance rates are very low (<5%)
- The compliance approach has focused on first party damages and resolving neighbor to neighbor conflicts (Complaint Process)

Current Status of Policy Development

- Ministry of Environment is testing a voluntary wetland mitigation guide to support and encourage better management of industry development effects.
- Agricultural drainage is the largest cause of wetland loss.
- WSA is implementing a new approach to agricultural drainage to address downstream impacts (agricultural wetland loss included).
- New revised wetland policy will follow.


Drivers towards a New Approach in Saskatchewan



MANITOBA

Algae warnings more than 30 years old

Lake Winnipeg's nutrient levels have grown 50 per cent

Draining land of water lands farmer in hot water

Digging ditches or removing ditch blocks requires agency approval

Flooding frustrates Manitoba farmer

Sask. drainage causing downstream flooding: Manitoba

Installing tile drainage a 'winning proposition'

Yield benefits in wet, dry years | Cost could be up to $600 per acre

Much ado DRAIN

Making a case for wetland inventory

Vol. 34, No. 43 Wednesday, November 12, 2014 $1.00 (GST Incl.)

Town won't pay for crop flood damage

New Rec. Director for Langenburg

Social, economic and environmental drivers

Drivers towards a New Approach in Saskatchewan

Feedback from the Drainage Forum (500 participants, Oct 2013-Oct 2014)

- Drainage is not a landowner right.
- If drainage impacts cannot be mitigated, then the project should not be allowed.
- Regulatory scrutiny should be scaled to the risk of the drainage project.
- High risk projects should require approval. For low risk projects participants were split between requiring approvals, registration, or free to proceed without notification.
- Participants strongly encouraged enforcement of policy principles and approaches regardless of project size.

Drivers towards a New Approach in Saskatchewan

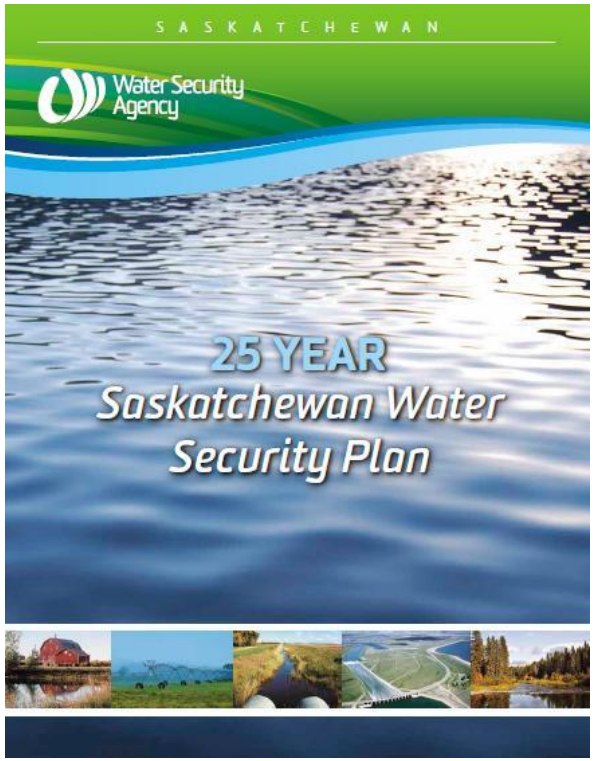
Feedback from the Drainage Forum (Oct 2013-Oct 2014)

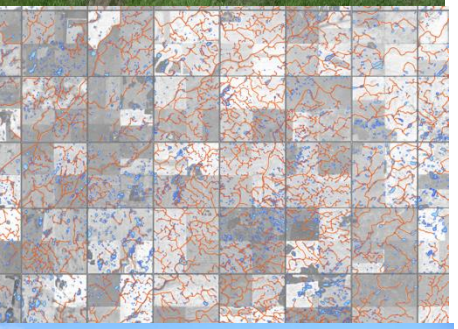
- Those who benefit from drainage projects should bear the costs of building and maintaining such projects.
- Project owners should bear the cost of damages they cause.
- Existing works should require the same approvals or registration as new projects.
- Specific drainage design and operation standards and rules must be followed.
- Review of project impacts should include upstream and downstream, flow rates, erosion, and short- and long-term.
- Wetland management was a sensitive topic with participants.
- Calls for increased compliance and enforcement consistently arose throughout all phases of consultation.

The New Approach

The Saskatchewan government initiated the New Approach for several reasons:

- 25 Year Saskatchewan Water Security Plan released Oct. 2012
  - Develop new legislation and regulations for drainage
  - Develop new strategies to address excessive moisture concerns on agricultural lands
- Calls from agencies to deal with illegal drainage
- Series of wet years with above normal runoff



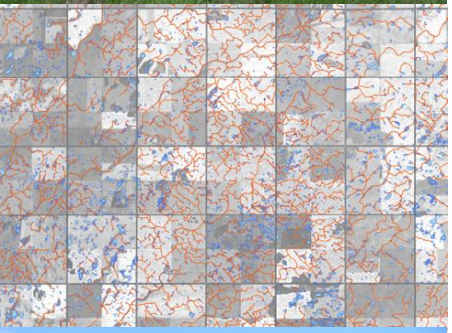


The New Approach Components

The New Approach has 3 components:

1. New Regulations
2. Implementation of the Regulations and the development of policies and procedures to support the implementation
3. Development of new Legislation

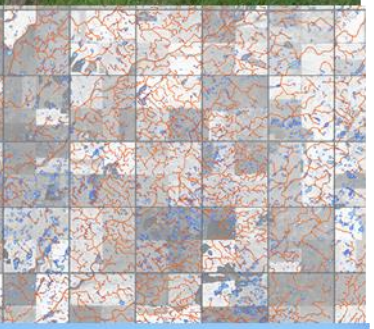
WSA has new Regulations, and we are partway into the implementation of the Regulations



New Regulations- Sept 1, 2015

All existing and new drainage works require a permit

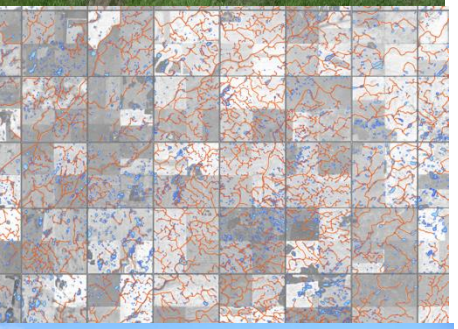
- In *Drainage Control Regulations*, Projects constructed prior to 1981 did not require Approvals
- In *The WSA Regulations*, the pre 1981 exemption has been removed
  - **Efficiency** - challenging to determine if a drain was constructed in 1980 or 1982
  - **Fairness** – the impact downstream is the same regardless of when the drain was built
  - **Knowledge** – adds all works to improve understanding of overall impacts of drainage works

New Regulations- Sept 1, 2015

A new suite of enforcement tools is being proposed, such as:

- Orders (current legislation)
- Fines (current legislation and new legislation)
- Stop work orders (new legislation)
- Administrative penalties (new legislation)
- The ability to lay charges easily (current legislation and new legislation)

New Regulations- Sept 1, 2015

In Section 13 of the Regulations, WSA must consider:

(2) On receipt of an application pursuant to section 12, the corporation shall consider:

a) the current and future impact, including predicted future cumulative impact, of the drainage works on:
   i. the property of others;
   ii. hydrology or water quality;
   iii. fish or wildlife habitat; and
   iv. any other factor the corporation considers relevant;

New Regulations- Sept 1, 2015

WSA can impose Terms and Conditions as follows:

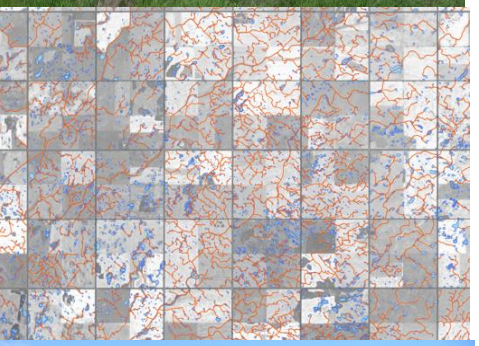
15(1) The term of a drainage approval:

(a) commences on the date on which it is issued; and

(b) unless sooner suspended or cancelled, ends on the date stated in the drainage approval.

(2) At the time of issuing the drainage approval pursuant to section 14, the corporation may include as a provision of a drainage approval any terms and conditions that the corporation considers appropriate, including a requirement for measures to reduce the impacts mentioned in section 13 that the corporation considers necessary.

- **This portion of the regulations will require WSA to develop mitigation policy to address flooding, water quality and habitat impacts**



New Regulations- Sept 1, 2015

Ensure project impacts are addressed

- Review considers impacts to downstream flooding, water quality and habitat are addressed.
- Mitigation of impacts is a required part of the drainage works approval process;

Implementation of the New Approach

VISION	Responsible Drainage within Healthy Watersheds				
Program Pillars	**Impact Mitigation**	**Quality Service**	**Regulatory Compliance**	**Knowledge & Information**	**Partnerships & Communication**
Goals	Water quantity (flooding / supply), water quality and habitat impacts of drainage are mitigated	Clients are satisfied with our service	Drainage works meet regulatory requirements	Our program is based on evidence and supported by appropriate data and tools.	Government, producers, stakeholders and citizens understand and endorse our approach
Strategic Outcomes	1 Approval process mitigates risk of impact 2 Extensive drainage is coordinated, organized, and properly mitigated *3 Mitigation projects reduce cumulative impacts of approved drainage**	4 Clients find approval process straightforward and timely 5 We meet staff needs to deliver quality service 6 There are enough QPs trained to meet client demand	7 Clients voluntarily comply with requirements 8 We target priority non-compliance (?) 9 We target compliance efforts at highest risks	10 We understand the impacts of drainage and how to mitigate them 11 We gather, analyze and manage data to inform, facilitate, and adapt program implementation	12 Producers value and lead the shift to responsible drainage 13 Key clients, stakeholders and government MLAs are partners in the shift 14 Government, producers, stakeholders and citizens are aware of the new approach and requirements
Critical Results	– Approval conditions are reasonable and achievable – Networks of drainage projects are identified – Risks are identified by project and watershed – Effective Mitigation is operational e.g.:	– Approval process is lean and meets service standards – Approvals are processed online – The strategic approach and program targets align with available resources – Clients have access to the advice and information they need – Client needs are identified – Staff needs are identified	– The appropriate compliance approach is applied in each circumstance – We monitor for and identify non-compliance – We have local knowledge of communities and social networks – Assigned staff have the necessary compliance knowledge and skills – We have the legislative / regulatory authorities we need	– We have detailed information on wetland location, status and drainage features – Outcomes of the drainage program are tracked – Decision support models are identified, developed and used – Databases that integrate offices and information are developed and used. – Decisions are adapted to reflect new information – Progress/success is regularly evaluated – Key research needs are identified	– We engage agricultural producers as partners in the shift – We seek feedback from key partners, stakeholders and government – Key research projects are implemented with partners – Program is adapted to respond to partner input – Our compliance approach and requirements are effectively communicated to government, clients, stakeholders and citizens – Intent and actual outcomes of the drainage program are communicated to government, clients, stakeholders and citizens
Performance Measures	❖ X% increase in surface water storage within priority basins ❖ X% reduction of water drained into priority terminal water bodies ❖ X% reduction of contaminants drained into water bodies of concern ❖ X% increase in wetlands in priority basins	❖ By 20XX, X% client satisfaction ❖ By 20XX, application reviews are completed within X days *(re: extreme, high, moderate, and low risk projects)*	❖ By 20XX, no more than X damage complaints received/yr ❖ By 20XX, X% works compliant with regulations	❖ By 20XX, drainage and wetland inventory is complete ❖ By 20XX, defensible targets for the goal of responsible drainage established	❖ By 20XX, X% stakeholder satisfaction with the program

Program Pillars	Impact Mitigation
Goals	Water quantity (flooding / supply), water quality and habitat impacts of drainage are mitigated
Strategic Outcomes	1. Approval process mitigates risk of impact 2. Extensive drainage is coordinated, organized, and properly mitigated *3. Mitigation projects reduce cumulative impacts of approved drainage**
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- **Impact**: is when the drainage activity results in a change in the resource which reduces the ability to use the resource
- Impact mitigation is delivered through:
  - Approvals process based on risk
  - Coordinated & organized drainage (C & D or network applications)
  - Mitigation conditions
- To achieve this goal a combination of actions to reduce risk of impact will be developed

Mitigation - Risk

- **Risk –** is potential for flooding, water quality and habitat impacts
- To assess risk 2 elements are considered:
  - ***Where*** the project takes place (i.e. watershed)
  - ***Size/Permanence*** of the individual project
- As a result, **risk of impact is project specific**
  - Larger impact projects in higher risked or more vulnerable basins will have more scrutiny.

*Figure 1: Identifying **watershed** vulnerability*

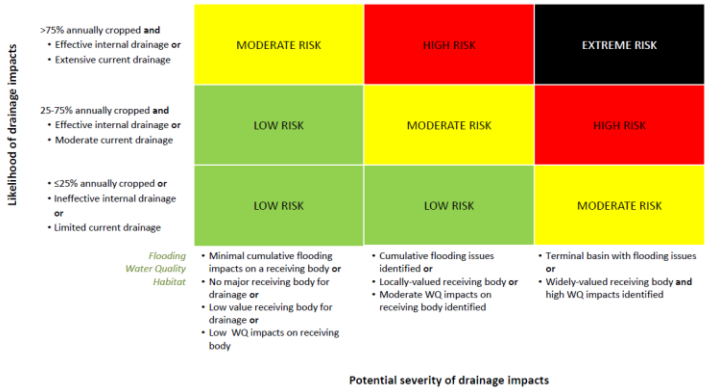
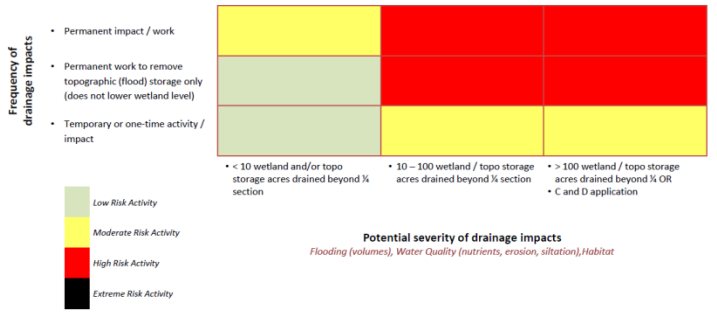
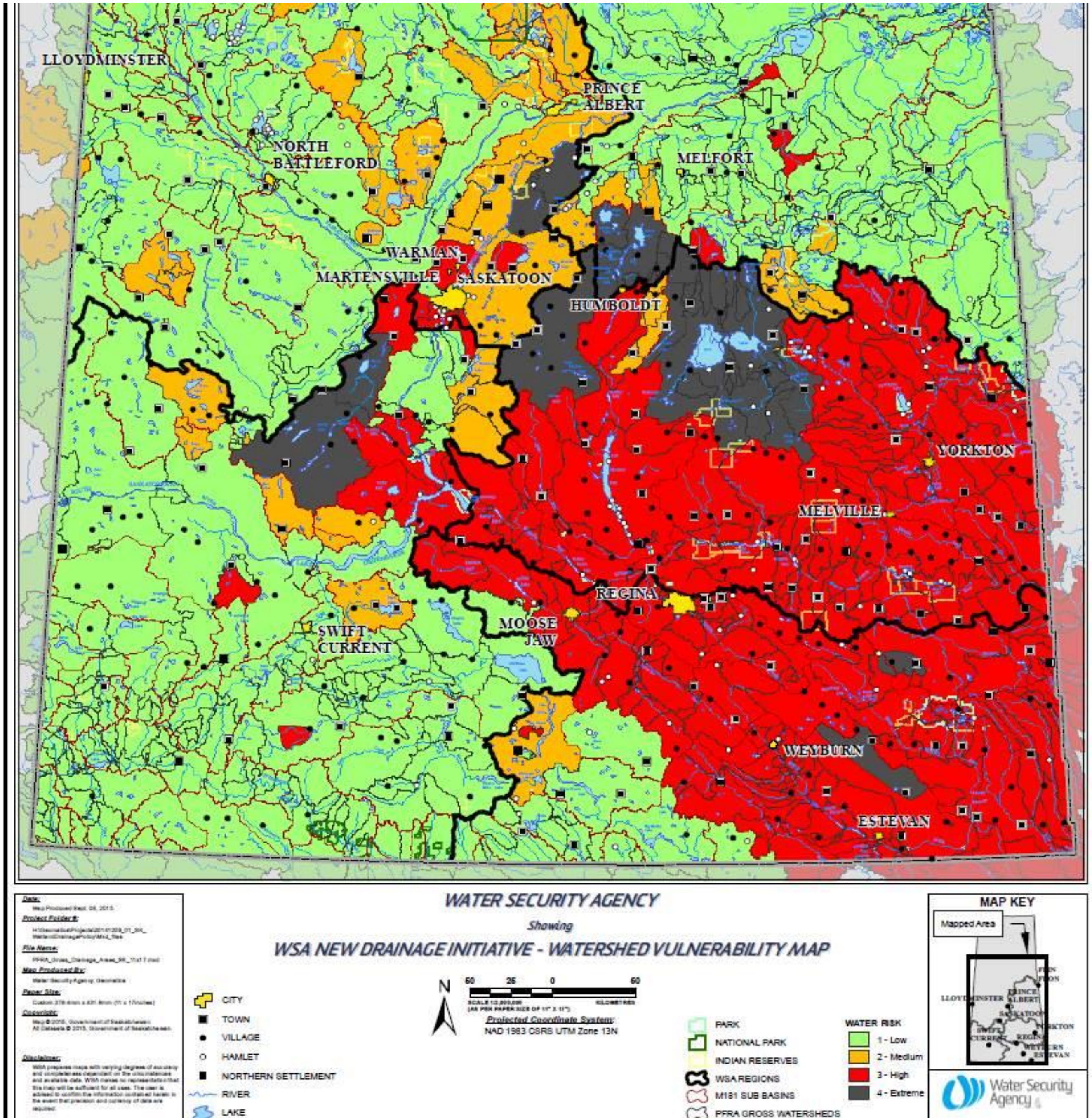


Figure 5: Determination of Activity Risk in a High-vulnerability Watershed (based on extent surface drainage)




LLOYDMINSTER
PRINCE ALBERT
NORTH BATTLEFORD
MELFORT
WARMAN
MARTENSVILLE
SASKATOON
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YORKTON
MELVILLE
REGINA
MOOSE JAW
SWIFT CURRENT
WEYBURN
ESTEVAN
WATER SECURITY AGENCY
Showing
WSA NEW DRAINAGE INITIATIVE - WATERSHED VULNERABILITY MAP
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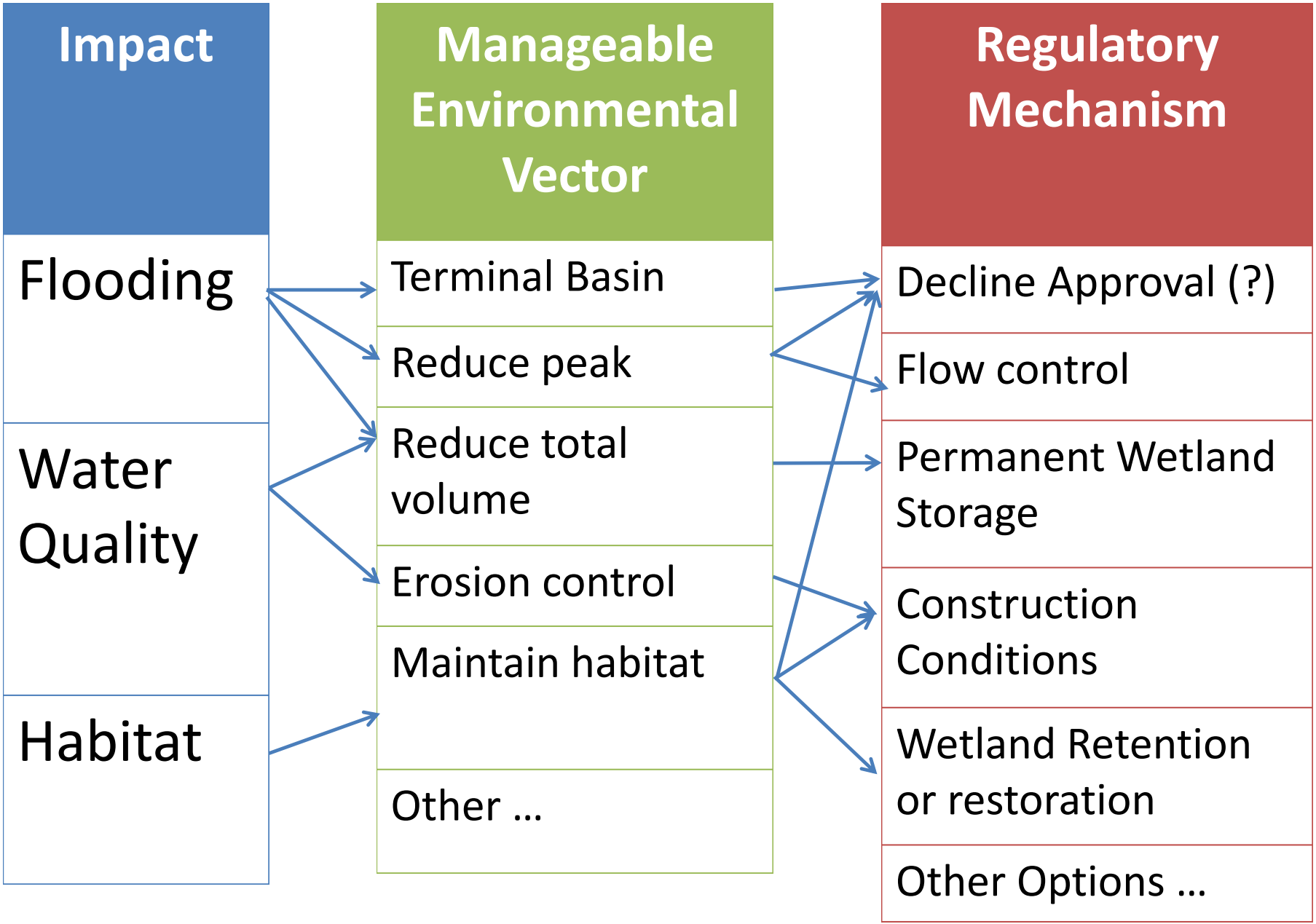
Projected Coordinate System:
NAD 1983 CSRS UTM Zone 13N
PARK
NATIONAL PARK
INDIAN RESERVES
WSA REGIONS
M181 SUB BASINS
PFRA GROSS WATERSHEDS
WATER RISK
1 - Low
2 - Medium
3 - High
4 - Extreme
MAP KEY
Mapped Area
Water Security Agency

Mitigation Tools

- Decline approvals (extreme risk)
- Land control to adequate outlet
- Construction, maintenance and operation conditions
- Flow control
- Permanent storage (maintaining or restoring)
- Coordinated application process and mitigation conditions for the Aquatic Habitat Protection Permit process (EMPA)
- Efficient approval process- online application, qualified persons

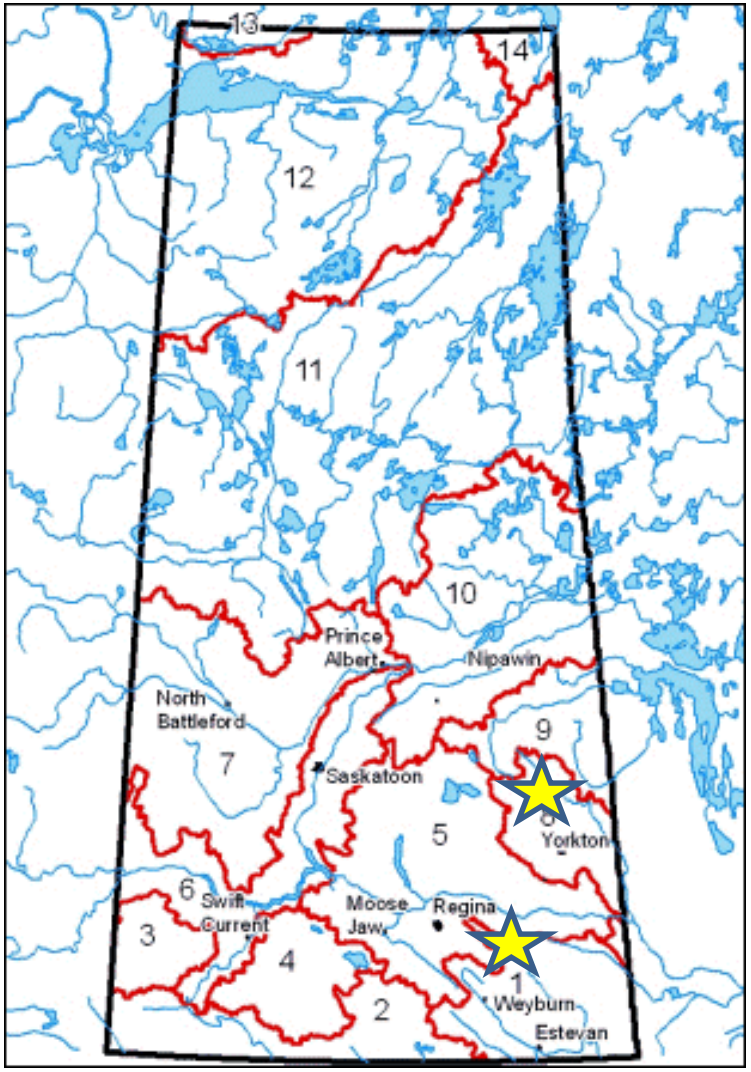
A Suite of Mitigation Tools



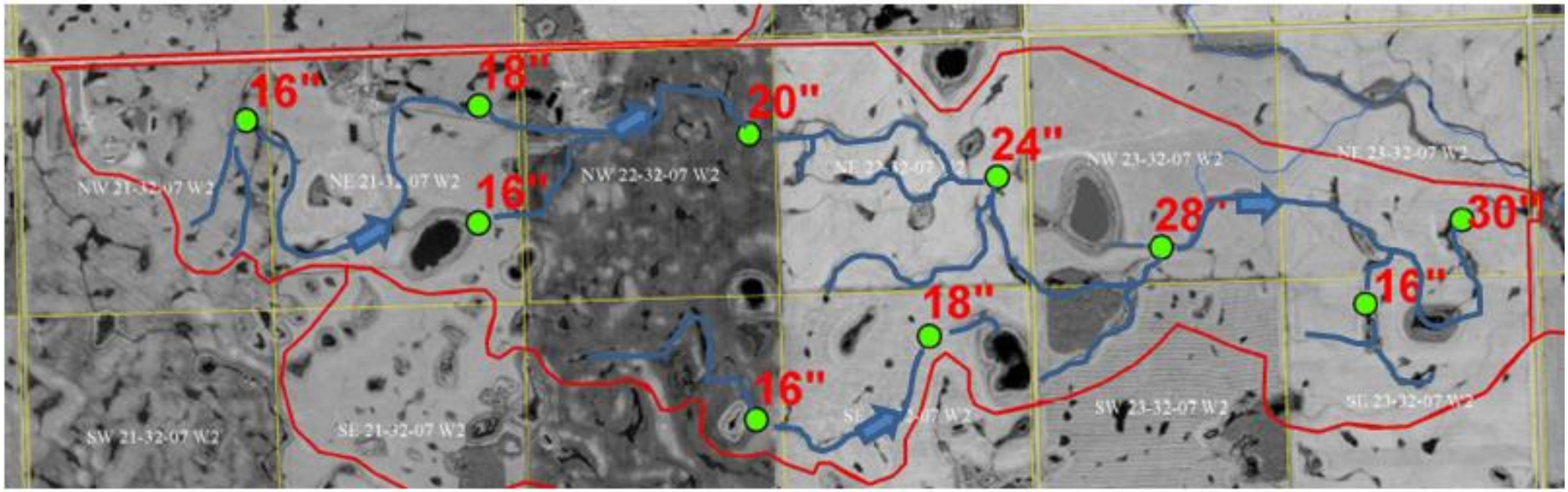
Pilot Projects

- Upper Spirit Creek
- Gooseberry Lake

- Components of Pilot:
  - Approvals
  - Mitigation
  - Qualified Persons
  - Compliance

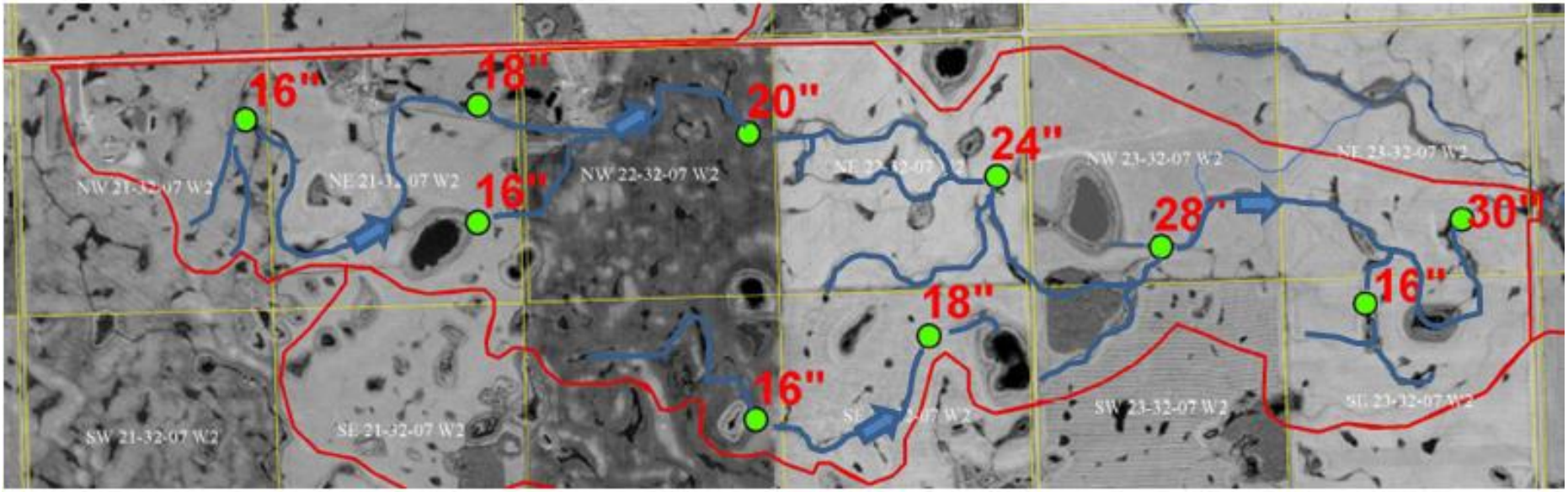


Piloting Mitigation

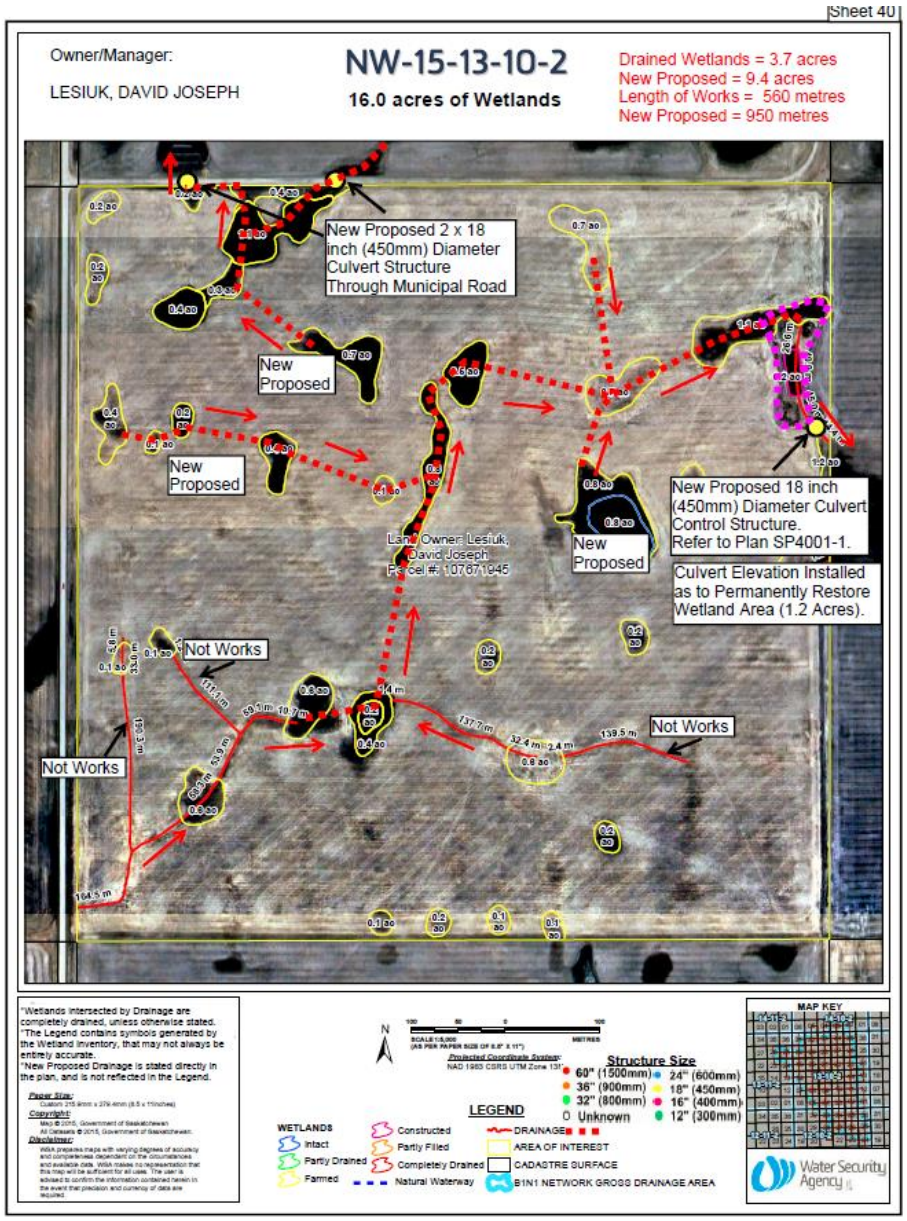


- A need to develop mitigation conditions that are:
  - Acceptable
  - Practical
  - Incrementally address down stream impacts

Piloting Mitigation

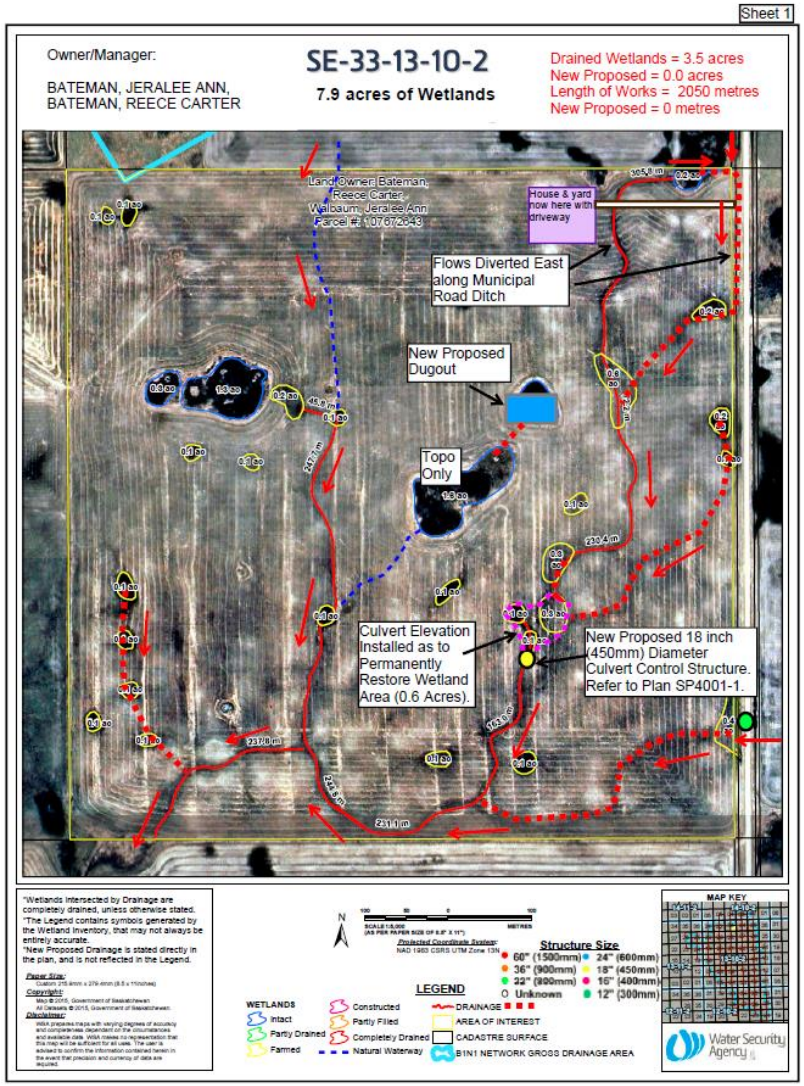


- All works within a ‘network’ are approved at once
- Network approach is critical for adequate mitigation
- Developed approach for flow controls and storage
    - Throttles reduce flow to 1 in 2 flow rates
    - Restore 10% of the wetland acres

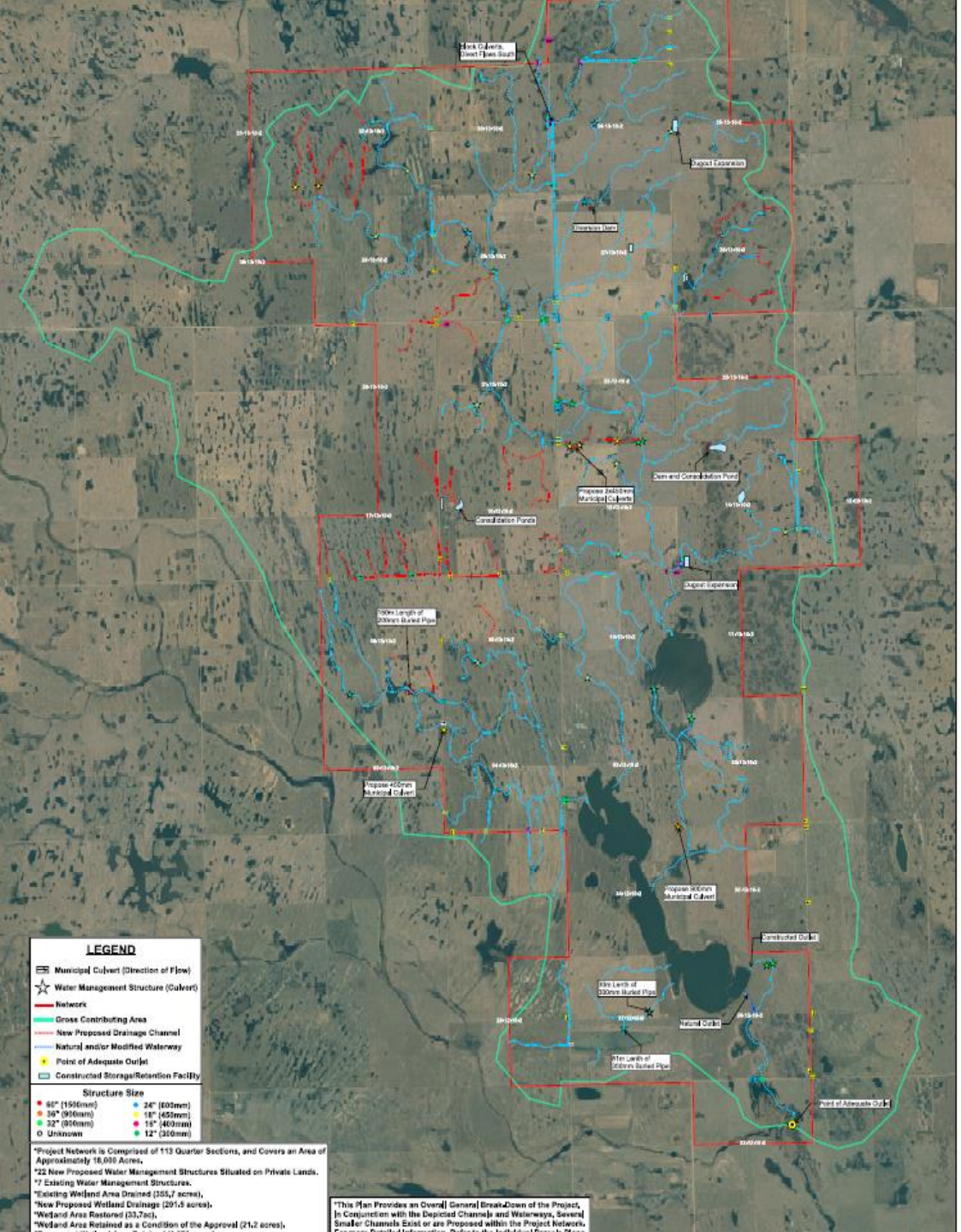


- Pilots engaged landowners/ operators and 5 RMs to seek approvals and implement mitigation measures with in pilot areas.
- Of 225 quarters:
  - **82% of operators were Willing to participate**
  - 9 % Maybe willing to cooperate
  - 9 % Not willing to cooperate

Lessons Learned



- Wetland inventory essential for designing mitigation
  - Which wetland to restore
  - Where to place flow controls
- Qualified persons were essential to approval efficiencies, land owner acceptance and mitigation design.
  - The need for educational materials, fact sheets and how to manuals
- Permitting in a “networks” allowed approval efficiency and mitigation design
- Mitigation conditions were acceptable to landowners



Large Networks

- WSA learned about:
  - There will be a number of large networks on the landscape.
  - Joint applications maybe an option for land control.
  - Efficiencies gained.
  - Pilot projects include a 113 quarter network.

CHALLENGES AND KNOWLEDGE GAPS

Current Challenges

- Estimate 100,000 to 150,000 unlicensed drainage works
- Resource constraints
- Staged implementation approach necessary or WSA will be inundated with applications
  - Anyone can apply at anytime?
  - Focus will be on the higher risk areas first?
- Enforcement will be phased in over time
- Seeking compliance over the long term
- Internal and landowner change management
- Perceived vs actual landowner acceptance

❖ **Knowledge gaps** - impacts of drainage need to be better understood so that WSA can fully exercise regulatory powers.

Knowledge & Information

Our program is based on evidence and supported by appropriate data and tools.

1. We understand the impacts of drainage and how to mitigate them
2. We gather, analyze and manage data to inform, facilitate, and adapt program implementation

- We have detailed information on wetland location, status and drainage features
- Outcomes of the drainage program are tracked
- Decision support models are identified, developed and used
- Databases that integrate offices and information are developed and used.
- Decisions are adapted to reflect new information
- Progress/success is regularly evaluated
- Key research needs are identified

- By 20XX, drainage and wetland inventory is complete
- By 20XX, targets for the goal of responsible drainage established

Knowledge & Information

- Is identified as a program pillar
- Science is essential to:
  - Address the Knowledge Gap barriers
  - Program evaluation and continuous improvement
  - Support the other pillars of the approach.
    - In particular, development and implementation of the **Impact Mitigation** pillar

Knowledge & Information

Knowledge & Information

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- By 20XX, drainage and wetland inventory is complete
- By 20XX, defensible targets for the goal of responsible drainage established

1. Understanding impact of drainage and how to mitigate

2. Set targets for mitigating the impacts of drainage

3. Develop and evaluation of effective mitigation

Impact Mitigation

Water quantity (flooding / supply), water quality and habitat impacts of drainage are mitigated

1 Approval process mitigates risk of impact

2 Extensive drainage is coordinated, organized, and properly mitigated

*3 Mitigation projects reduce cumulative impacts of approved drainage**

- Approval conditions are reasonable and achievable
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-

- X% increase in surface water storage within priority basins
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- X% increase in wetlands in priority basins

Knowledge Gaps

Primary Knowledge Gaps:

1. Determine the magnitude of impact associated with drainage activity related to:
    a) Water quantity
    b) Water quality; and,
    c) Habitat
2. Develop/define targets and thresholds
3. Evaluate the effectiveness regulatory program to address the impacts
4. Assess future mitigation options
5. Complete the wetland & drainage inventory

Knowledge Gaps - Flooding

1. Understanding the impact of drainage.
   - Drainage may increase flooding impacts (Pomeroy et al; but, van der Kamp et al)
   - We need:
     - **certainty of the impact,**
     - **understanding of scale and magnitude.**
2. Set targets/thresholds for mitigating impact
   - If drainage increases flooding impacts, then what is the magnitude and scale of the impact?
3. Develop and evaluate effective mitigation
   - What are the mitigation tools that effective, efficient, and acceptable.
     - E.g. Throttles, storage

Knowledge Gaps - Water Quality

1. Understanding the impact of drainage.
   - Wetland drainage contributes nutrients (Westbrook, Badiou).
   - Do these nutrient contributions result in an impact?
2. Set targets/thresholds for mitigating impact
   - If so, what is the magnitude and scale of the impact?
   - And, what thresholds should be set (PPWB, IJC)?
3. Develop and evaluate effective mitigation
   - What are the tools that effectively, efficiently, and are acceptable that mitigate the impact.
     - E.g. Flow control unlikely to fully mitigate - what are other options can be employed?

Knowledge Gaps – Habitat

1. Understanding the impact of drainage.
   - Wetland drainage reduces habitat (PHJV implementation plan).
   - Body of science exists to inform our understanding of the impact.
2. Set targets/thresholds for mitigating impact
   - Conserve SAR Critical Habitat and important fish habitat
   - Contribute to PHJV habitat objectives
3. Develop and evaluate effective mitigation
   - Decline applications and monitor compliance for SAR Critical Habitat and important fish habitat.
   - Incentive programs (NAWMP partnership).
   - Monitor habitat loss rates.

Knowledge Gaps

Other gaps:

1. Assessing future mitigation options.
   - As science fills knowledge gaps new and innovative mitigation options maybe developed evaluated and implemented.
2. Wetland & Drainage Inventory:
   - Current inventory 8.5 million acres complete
   - Proposed over 15 million acres completed in 3 years

Some Final Thoughts

- Why WSA is moving ahead
- Behavioral changes
- Compliance
- The challenges

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