Solid Waste Management

Solid Waste Management Planning

Kamloops, July 10-11, 2019

FIRST NATIONS
LAND MANAGEMENT
RESOURCE CENTRE

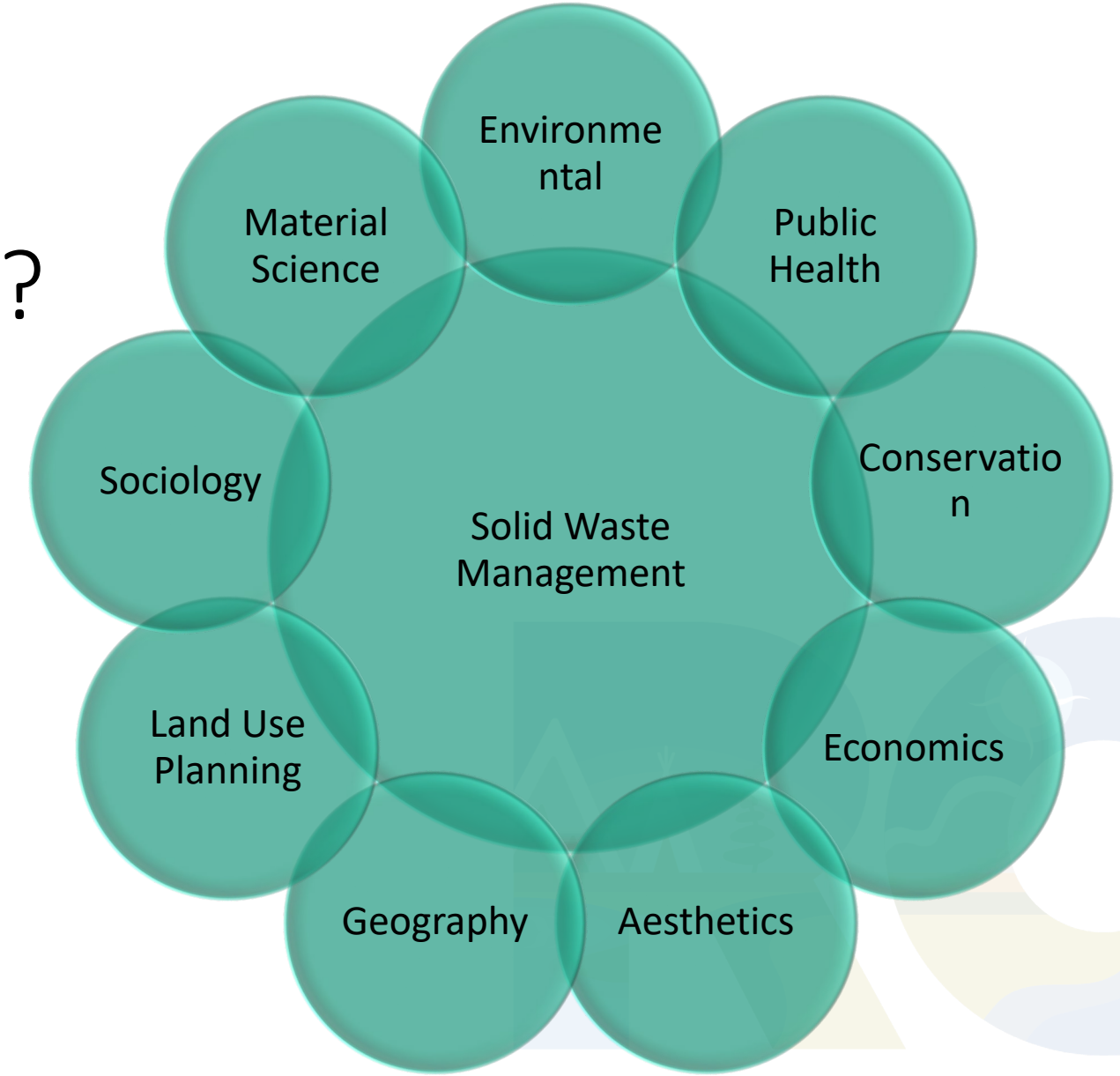
Presentation Overview

- Definition
- Why it’s important to manage solid waste
- First Nation issues in solid waste management
- Introduction to Solid Waste Management Planning

What is solid waste?

- Any material, non-hazardous or hazardous that has no further use and which is managed at recycling processing or disposal sites.
- Common types:
  - Municipal Solid Waste (MSW) – trash from everyday items that are discarded by the public
  - Hazardous Waste
  - Industrial, Commercial & Institutional Waste (ICI)

What is Solid Waste Management?



Current Waste Generation & Needs

Future Waste Generation & Needs

Why is solid waste management important?

Reduces Environmental risks, Climate change, GHG emissions	Good governance	Cultural responsibilities – stewards of the land	Provision of Economic opportunity – employment
Source Water Protection – reducing surface & ground water contamination	Limit liabilities for communities	Corporate & Social responsibility	Elder/youth mentoring
Makes effective use of natural resources less need for landfilling etc.	Integral to the health and safety of community	Future generations	Reduced costs over the long term – minimize current & future waste management costs

First Nation Issues in Solid Waste

- Illegal dumping on reserve lands
- Stockpiles of divertible waste (e.g. End-of-life vehicles, scrap tires etc.)
- Funding is needed to develop plans & programs
- Competing infrastructure priorities
- Improper containment & disposal to prevent contaminants from entering the surrounding environment
- Air Quality – pollutants from burning
- Production of greenhouse gas emissions from organic waste
- Leaching of toxic contaminants from landfill into surface water and groundwater

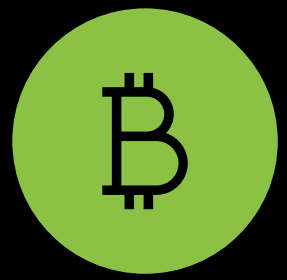
First Nation Issues in Solid Waste

- Limited budgets
- High cost per capita of building and maintaining infrastructure
- Lack of culturally appropriate training/awareness programs delivered to First Nations
- Improperly designed dumps – not engineered, no leachate collection, unlined disposal sites
- Security of community sites – lack of fencing etc.
- Need for policy and regulatory frameworks
- Need for emergency planning
- Lack of enforcement of First Nation Laws
- Lack of monitoring and evaluation
- Lack of record keeping
- Most sites are not operated to meet modern environmental standards

What does a Solid Waste Plan do?

- Understand current situation
- Define goals and priorities
- Identify appropriate strategies
- Develop a plan for implementation, monitoring, and evaluation
- Collaborative - shared responsibility at all levels
- Prioritizing infrastructure, operational activities, and waste types to reduce the risks to human and the environment
- Committing to continuous improvement to the waste management system over time. – ways to improve the current capital and operating budgets
- Allows for a community to monitor and report on progress

A good Waste Management Plan



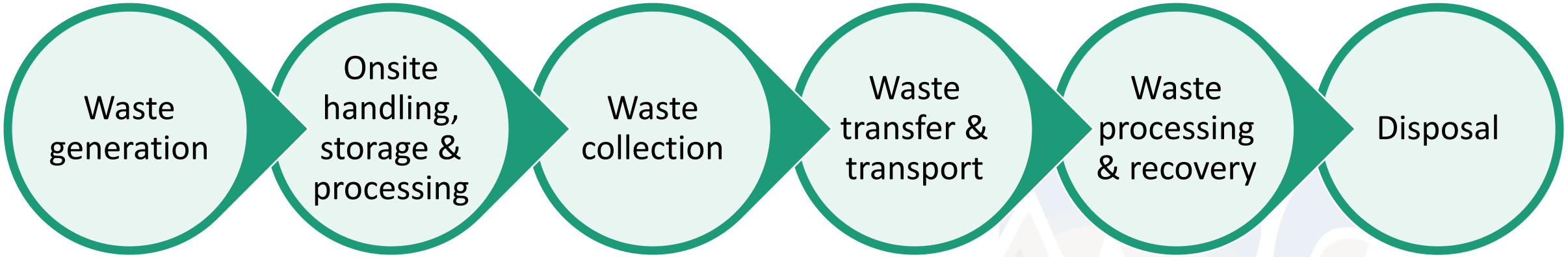
SHOULD BE FOR A 20-YEAR PERIOD (MINIMUM)

INCLUDE DESIGN DOCUMENTS PREPARED BY A LICENSED PROFESSIONAL ENGINEER WITH APPROPRIATE EXPERTISE AND EXPERIENCE

ENGAGES RELEVANT STAKEHOLDERS

INCLUDE A COMMUNICATION STRATEGY THAT ENSURES COMMUNITY ENGAGEMENT & AWARENESS

Elements of the Waste Management System



What is included in a Waste Management Plan

- Waste types and quantities
- Regulations & bylaws
- Funding
- Partnerships
- Community engagement & awareness
- Leadership
- Technologies & technical capacities
- Priorities (short & long term)
- Challenges and Needs
- Geoclimatic Setting

Community Waste Assessment & Feasibility Study

- Community Profile – Using existing demographics & waste data to understand current waste generation.
- What types, quantities, and sources of waste are generated annually?
- How many legacy waste, such as drums, appliances, end-of-life vehicles, and other materials are stockpiled in the community?
- What are the long-term waste generation projections based on population trends and economic factors?
- Assess the existing WM Facility and potential new sites
- Set waste management priorities for the community- engagement & awareness – educate, collect info , validate the conclusions & discuss options

A feasibility study examines the options for new solid waste management processes.

- Steps could include:
  - Develop a Terms of Reference
  - Selecting contractor(s)
  - Reviewing drafts
  - Reviewing the final report
  - Reviewing options
  - Decision on how to proceed

Waste Audit

A PROCESS TO DETERMINE THE TYPES AND QUANTITY OF WASTE BEING GENERATED IN A COMMUNITY.

THE CHARACTERIZATION OF WASTE CAN BE CHALLENGING BECAUSE IT IS NOT WEIGHED IN MANY COMMUNITIES.

IN CANADA 40% OF WASTE COMES FROM RESIDENTIAL SECTOR THE OTHER 60% COMES FROM NON-RESIDENTIAL.

THE NUMBERS ARE DIFFERENT FOR FIRST NATION COMMUNITIES, THEY TEND TO GENERATE LESS WASTE PER CAPITA

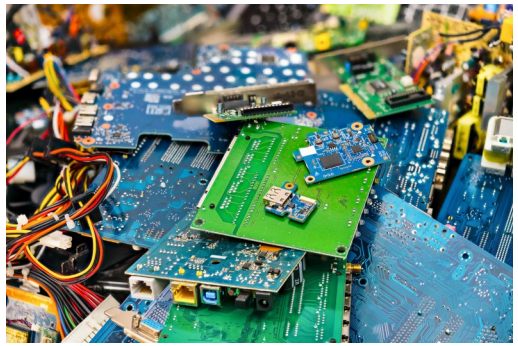
CAN UNDERTAKE A WASTE AUDIT TO GET SOME DATA TO BASE PROJECTIONS ON

CAN BE CONDUCTED AT THE SITE OR CURBSIDE

CAN BE A GOOD ACTIVITY TO DO WITH YOUTH

Major Waste Types

Hazardous Waste



Electronic Waste

Derelict Vehicles

Bulky Waste

Construction, renovation & demolition waste (CRD)

Scrap Tires

Organics

Reusable items & Recycleabes

Assessing the Existing Facility & Potential New Sites

- Health, Safety & Environmental concerns?
- Meeting Regulatory Requirements?
- Materials requiring Off-site disposal?
- Materials requiring On-site disposal?
- Recyclables or compostables?
- What is the remaining life of the current facility in terms of disposal capacity?
- What possibilities exist for upgrading or expanding the current site or building a new one?
- The community may need a new site if they don’t have an existing site, or if the current site is at capacity and cannot be expanded or upgraded.

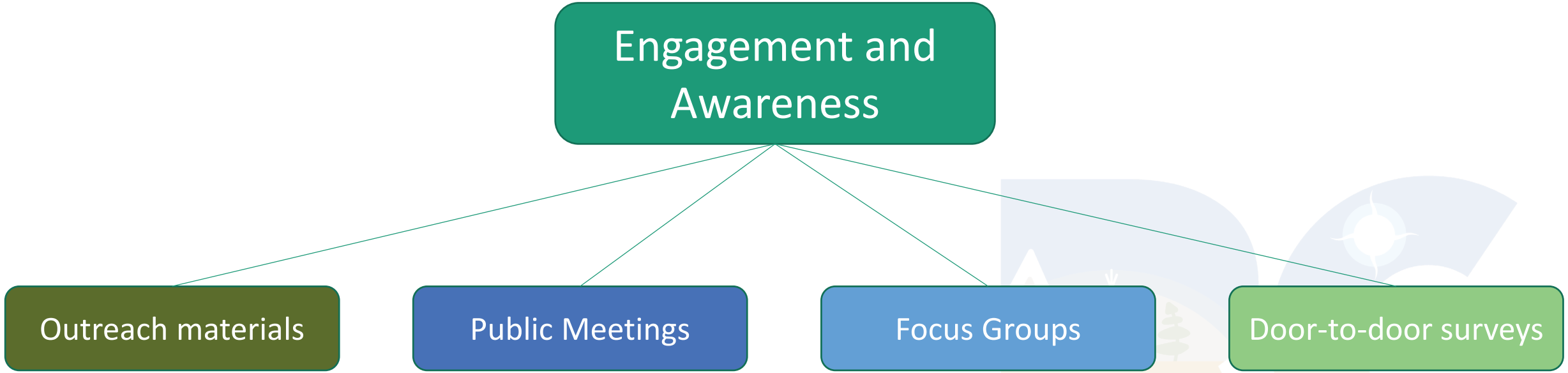
Identify & Evaluate Options

- Meeting existing federal, provincial and local regulatory requirement
- Setting your communities to meet or exceed those (prov or fed)
- Retaining qualified professionals
- Using appropriate technologies and adopting best practices
- Exploring program and policy tools
- Identify funding sources & potential partnerships
- Capacity building
- Land law development – prohibit unauthorized disposal, littering, etc.

Exploring Partnership Opportunities

- Necessary and beneficial to achieve the goals and implement actions of the strategy.
- Regionalize service – waste collection and/or disposal, and programs (e.g. education, recycling)
- Share equipment, staff, knowledge, experience, and other resources of nearby communities
- Community groups may be interested in assisting with operation of reusable items area
- Educational institutions, research institutes and or the private sector to explore new programs and technologies not otherwise available due to economies of scale
- Recyclers may have mobile equipment that can be brought to the site temporarily to facilitate off-site transport (e.g. mobile crushers for end-of-life vehicles)
- Transportation companies may have available capacity and discounted rates for backhauling wastes

Setting Waste Management Priorities for the Community



Example Waste Management Goals & Priorities

Prevent and reduce	Prevent and reduce waste generated at the source
Divert	Divert waste disposed at landfill (e.g. organic waste)
Improve	Improve waste facilities, practices, programs & initiatives
Establish	Establish new waste diversion programs & initiatives
Modernize	Modernize waste management facility operations
Segregate and manage	Segregate and manage hazardous waste
Develop	Develop policies and regulations to support community strategies in solid waste management
Gather	Gather information to facilitate decision-making at waste facilities

Operations & Maintenance

- Safety of public, workers, environment
- Site Control & Nuisance Management
- Schedule of recommended general operational activities for the site daily, weekly, monthly and annual basis
- Waste screening & Segregation
- Develop standard procedures for waste screening (what is acceptable and from whom)
- Train staff on procedures
- Practice random load checking
- Educate generators & carriers on restrictions, have signage
- Require movement documents for hazardous and special waste acceptance

Health & Safety

- Health & Safety
- Adequately trained workers
- Personal Protective Equipment
- Eye wash station, first aid kit, fire extinguisher

Emergency Preparedness & Response

Staff trained to respond effectively to emergencies

Some common emergencies at Waste sites are: fuel spills, chemical spills & fires

Have an emergency preparedness plan

Wildlife Management

Keep animals away for their protection. Animals are attracted to odour.

Separate people and animals!

Common wildlife:

- Large predators (e.g. bears) can become habituated and aggressive towards operators and the public, presenting a safety concern
- Smaller predators (ex. foxes, feral dogs) can become aggressive and may carry rabies
- Birds (e.g. vultures, ravens) can create litter issues as they rip up bags to get to food
- Rodents – burrowing animals can cause damage to berms and retention ponds

- Main methods to mitigate risk:
  - reducing ease of access to attractants (food scraps, glycol)
  - Waste segregation by type
  - Installation and maintenance of fence (electrified if possible)
  - Cover landfilled waste and compost piles that present a food source and odour – e.g. In compost pile, cover with shredded paper or woodchips

Record Keeping

- A historical record of operations, volumes and types of waste managed, investments and costs will provide the foundation for recognizing trends, better anticipating future needs of the site and will allow the community to plan for improvements.
- Tracking costs associated with operations
- Materials used for construction and maintenance
- Types and quantities of waste transported off-site for recycling, treatment or disposal

Performance Monitoring and Reporting

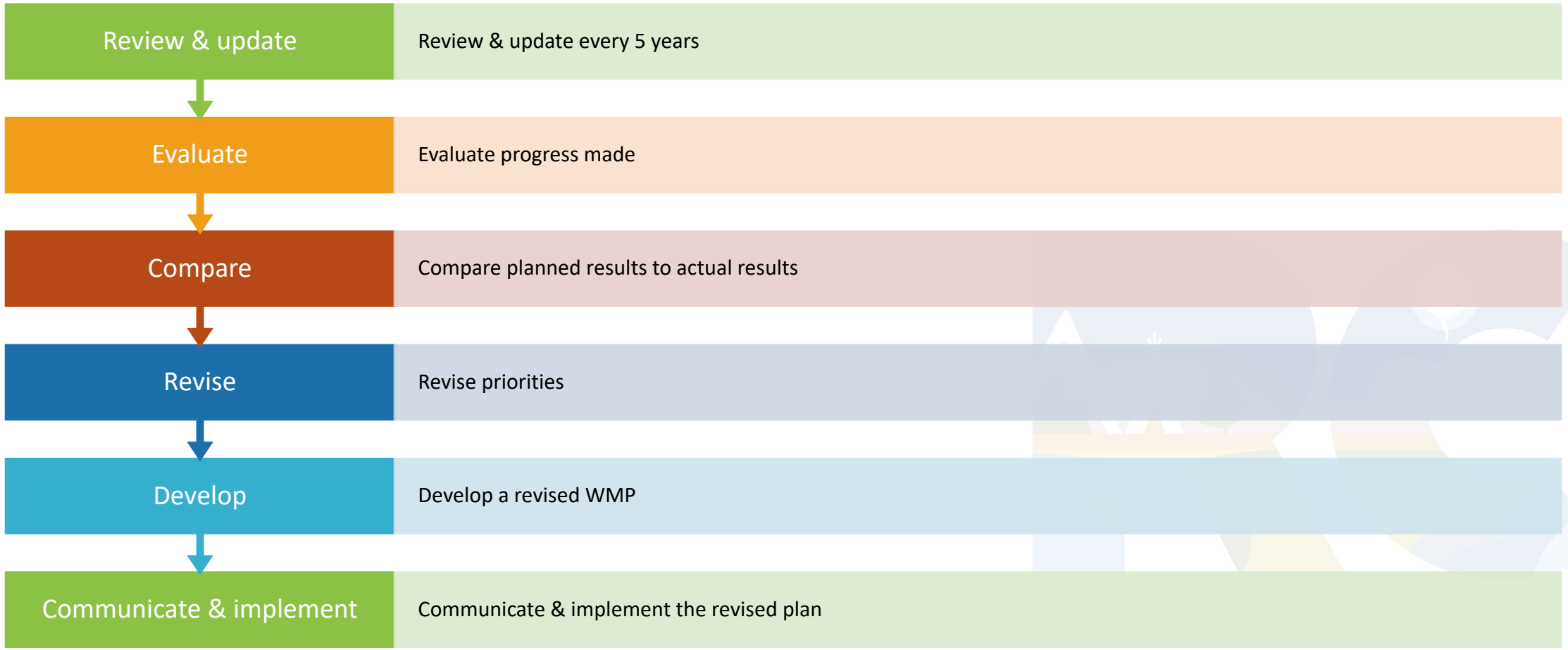
- Monitoring programs should be established to detect contamination
- Should be designed by suitably qualified professionals
- Sampling including analysis, storage, shipping etc. should be completed with appropriate training and experience
- Laboratory analyzing samples should be certified by the Canadian Association for Environmental Analytical Labroatories
- Important to keep accurate records for reporting purposes
- Class 1 Landfills – Groundwater, surface water and leachate at least twice per year, and landfill gas quarterly
- Class 2 Landfill – Groundwater, surface water and leachate at least once per year

Site Closure and Post-Closure

Closure – where the area is decommissioned in a manner that promotes revegetation, minimizes leachate, and ensures that uried residual waste does not pose a physical hazard to people or animals that may use the site

Post- closure – where the area is monitored over the long term for evidence of releases to the surrounding environment andmaintaned to ensure the integrity of the various engineered systems.

Implement, Evaluate & Improve the SWM Plan



Examples of Measures of Success

- Quantity of HHW and special waste diverted
- Number of end-of-life-vehicles shipped out of the community
- Quantity of compost produced
- Quantity of recyclables diverted
- Number of visits to the free store and current inventory

Breakout session:

- Identify some of the challenges that your community faces in solid waste.
- Where is your community in terms of solid waste management planning –
  - No plan, has a plan but needs to be update, missing key elements from existing plan, etc.
- What are some of the goals you would like to see set for your community in solid waste management? Examples:
  - Wastes will be sorted, processed, and stored temporarily on-site for reuse, recycling, composting or treatment
  - Improving segregation and signage
  - Depolluting wastes that contain hazardous substances
  - Re-using materials on-site or within the community
  - The quantity of waste requiring disposal will be greatly reduced over time and any residual on-site will be done in an environmentally-sound manner
  - Community members and the private sector will be actively engaged in sustainable waste diversion activities

Questions? Comments?

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