Environmental Management
Best Practices

National Aboriginal Lands Manager’s Association
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What is Environmental Management

A process used to inform decision making, to develop strategies, projects and programs with the goal to protect the environment and natural resources.

Includes protection of resources for use in the practice of Indigenous (inherent, Treaty & Constitutional) Rights.

Sustainable use of resources to ensure ecosystem health and to sustain life.

Why is EM important?

1. Helps us understand the state of the environment – past and current
2. Provides understanding of negative impacts and how to reduce or mitigate them
3. Protection of resources to sustain life, protect human health and practice rights
4. Promotes due diligence, compliance and reduces liabilities
5. Serves as a guide to achieve environmental goals
6. Saves money

Why is EM important - considerations

- Healthy environment promotes healthy community
- Modern living has resulted in significant environmental challenges:
  - Climate change,
  - Waste & Pollution
  - Cumulative effects
  - Loss of identity and culture
- Our Ancestors survival relied on EM
- EM should protect our community including:
  - Community values
  - Management & protection
  - Prevention of impacts
  - Honour traditional knowledge
  - Inclusion of all community members
  - Future planning for sustainability

What is Environmental Management?

- Technically: EM involves decisions, strategies, programs and projects to use or protect the environment in order to meet broader social objectives
- From an Indigenous perspective EM includes a holistic approach rooted in community traditions, values and traditional knowledge to address community environmental issues and concerns as well protect the interests of future generations and retain an Indigenous way of life.
- Effective EM includes two-eyed seeing – the combination of TK and western science

Environmental Laws in Canada

1. *Impact Assessment Act* – Evaluates projects to understand the environmental and social impacts to apply appropriate conditions and mitigations
2. *Canadian Environmental Protection Act* – pollution prevention, assesses and manages risks related to chemicals; including fuel
3. *Species at Risk Act* – conservation and protection of biodiversity and fulfills international obligations to protect species
4. *Fisheries Act* – protect and manage fisheries resources

Provincial and Municipal Authority

Provinces:

- Environmental Assessment – forestry, mining, oil & gas
- Resource management – water, soil, land (forests, parks)

Municipalities

- Services such as roads, infrastructure and waste management

Standards, guidelines & codes of practice

Environmental standards & Guidelines

- Rules to control the impacts of human on the environment, to ensure development do not affect the environment.

Codes of Practice

- a structured set of written guidelines that outlines how individuals in a particular profession, industry, or organization should behave and operate. It’s like a rulebook—but more focused on best practices, ethics, and safety than strict law

Environmental components

- Air
- Water
- Land
- Vegetation
- Wildlife (mammals, birds, fish, amphibians, insects and microbes)
- Humans
- Indigenous Rights

Valued Ecosystem Components (VECs)

- Some components are valued higher than other in some instances and in relation to certain developments ie moose
- The Impact Assessment Agency defines these as "*The aspects of the environmental, health, social and economic conditions that may be important to you or your community*"

How is air impacted?

Human Activity:

1. Transportation
2. Industry
3. Households – cooking, heating

Natural Sources:

1. Wildfires
2. Dust storms
3. Secondary pollutants due to chemical reactions in the atmosphere – ie: ozone

Some common pollutants

- Nitrogen dioxide (NO2)
  - Commonly formed by burning fuel, contributes to smog
- Volatile organic compounds
  - Released from vehicles, industrial processes and agriculture

Air – pollution prevention Best Practices

Issues

- Emissions (NO_2 & VOCs)
- Carbon dioxide (CO_2)*
- Waste management*
- Infrastructure
- Industrial activity
- Noise
- Odours
- Climate change
- Health

Best Practices

- Ensure all FN owned vehicles are maintained, purchase low emission vehicles or EV
- Ensure furnaces are maintained and running efficiently
- Maintain heavy equipment
- Control, minimize or prevent burning at waste facility
- Burning by-laws

Air – permits and leases

- Draft terms & conditions within permits/leases for activities that may produce air pollutants
  - Farming – lessee must maintain equipment and ensure all emissions are managed
  - Industrial – depending on the activity standard conditions will apply and can be found through government agencies, experts and the proponent/lessee
    - Potential impacts will be identified through the environmental review process
  - Electric vehicles to be used whenever possible
  - No burning or only when permitted

How is water impacted?

- Consumption (quantity)
- Evaporative loss (quantity)
- Sewage (quality)
- Industry (quality and quantity)
- Waste management – leachate (quality)
- Pesticides, herbicides and fertilizers (quality)

Water – pollution prevention Best Practices

- Understand current quality & quantity
- Industrial activity on or adjacent to Reserve & within Traditional Territory
- Over allocation
- Contamination
- Temperature increase
- Flow
- Understand water flows, source water for your community
- Ground water protection
- Surface water protection
  - Lakes
  - Wetlands
  - Rivers & streams
- Water cistern install and maintenance

Water management Best Practices - Management

- Undertake Source Water Protection plan
  - Identify all sources of water – ground and surface
  - Identify water needs – residential, commercial & industrial
  - Identify accessibility to water
  - Identify impacts to source water
  - Work with municipality and Provinces to develop protection plan including mitigation
- Participate in watershed management processes with Province &/or municipality
- Participate in duty to consult
- Join water protection organizations - NGOs

Water management Best Practice

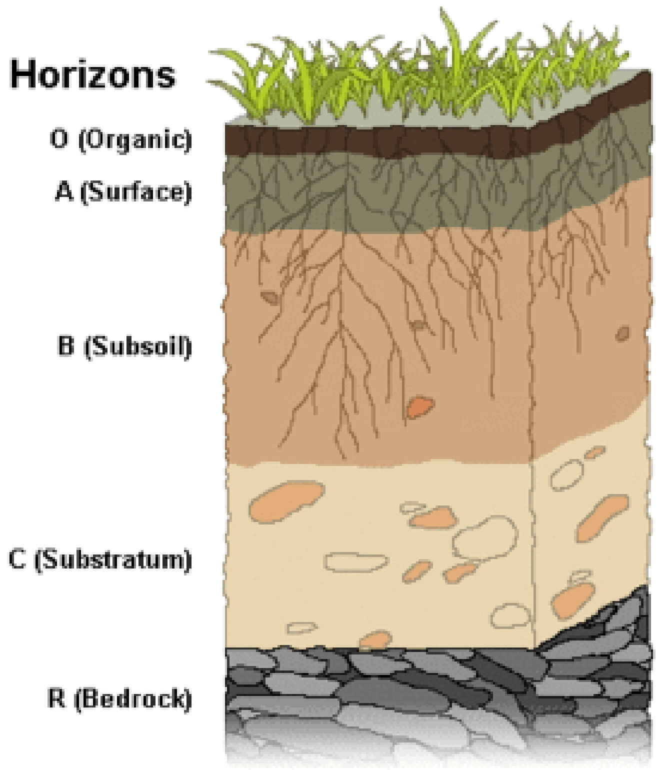
- Ensure all water and wastewater infrastructure is maintained on schedule – all operators must be trained and comply with operating procedures
  - Develop checklists and schedules to simplify process and promote compliance
- Ensure all public buildings, businesses and household plumbing is maintained to avoid water loss through leaking faucets, toilets or infrastructure to/from the house
- Monitor water sources frequently – note changes in flow, colour, sediment load, odours, fish and aquatic plant health

Land

- Land is understood to be:
  - Surface of earth that is not covered by water
  - Made up of rock, soil and minerals
  - soil – type, depth, use
  - Topography – flat, hills, banks, gullies, cliffs
  - Provides substrate for vegetation, defines water flows
- Soil is the focus of our discussion for land management on Reserve

Soils

- Soil take millennia to develop and is a critical strand in the ecosystem web.
- Should be handled with care
- Three layers, generally
  - Topsoil – ‘O’ horizon and surface
  - Subsoil – ‘B’ horizon
  - Parent material – bedrock



Land – contamination sources and other issues

- Alteration and loss of land
  - Agriculture
  - Industrial activity
  - Resource development – mines, gravel, forestry
  - Urbanization
- Soil contamination – run off, chemicals, spills
- Soil loss - erosion
- Structure fires
- Waste management
- Fuel storage
- Illegal activity – wire burning

Land Management – BPs for soil handling

- Two lift procedures – separating topsoil from sub soil, maintaining separation through piling
- Weed management on soil piles
- Protection from wind erosion
  - Understand wind conditions, pile soils in a position to avoid loss to wind
- Wash equipment and other vehicles to avoid spread of seeds from invasive species – thistle

Land – BPs for soil handling in farming

- Farming practices
  - Avoid over tilling, disking, harrowing or generally overworking soil. This can break down organics and increase fines allowing for greater wind erosion
  - Application of manure, compost – application rate and quantity should be done in consultation with a soil scientist or agrologist. Do not spread where manure will enter waterways.
  - Herbicide and pesticide application – minimize use as much as possible to avoid impacts to surrounding land, vegetation, water, wildlife and community members.
  - Know your soil type and history of the use of land, conduct audits and site assessments when possible (annually, 3 years, 5 years)

Fuel Storage

- Improper storage and handling of fuel/hydrocarbons can lead to contamination of land, water, vegetation and may impact human health
- One of the top environmental issues on Reserve
- Costly to clean up
- Time consuming
- Removes land from future use for long periods of time
- Limits future use of land
- Safety issue – fire, health, contamination

Fuel Storage BPs

- Ensure all operators have knowledge about tank operation and monitoring
- Register your tanks
- Ensure fuel delivery drivers are compliant and take care when filling tanks
- Berm all tanks to hold entire volume of tank, even double walled tanks!!

Fuel Storage BPs

- Be aware of the *"Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations"* under the *"Canadian Environmental Protection Act 1999"* CEPA
  - Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products
- Leak detection and monitoring
- Record keeping
- Storage tank regulations check list
- Emergency Plan in place
- Avoid underground and single walled tanks

Waste Management - issues

- One of two top contamination/environmental issues on Reserve
- Isolates or sterilizes lands from future land use
- Potential to contaminate soil, air and water
- Impacts to medicinal plants and wildlife
- Greenhouse gas emissions
- Burning
- Illegal dumping
- Litter
- Wildlife and dogs

Waste Management – why is this important?

- Save money,
- Foster responsible environmental management,
- Protect the health and safety of the First Nation citizens, residents, employees, pets, livestock,
- Protect the environment through action on climate change, ecosystem health & reduced sources of contamination, and
- Strengthen community mental, physical and spiritual wellbeing.

Challenges

1. Solid waste include multiple types of materials,
2. Waste management is expensive, time consuming, requires trained staff and updated facilities,
3. First Nations lack funding, available labour and training and access modern infrastructure,
4. Many First Nations are remote, lacking all weather roads to transport waste, and
5. Jurisdiction – First Nation, Federal, Provincial, Municipal

Legislation & Regulation

Waste management is a shared responsibility of First Nation, Federal, provincial, territorial and municipal governments.

On Reserve the authority to regulate waste management is administered by ISC through the *Indian Act*

First Nations can create bylaws under the *Indian Act*

The *First Nations Land Management Act* provides a mechanism through which laws can be enacted

Regulatory Gap

First Nations fall within a regulatory gap due to jurisdiction or division of authority:

Federal government does not develop in-depth policy on waste management or environmental protection on Reserve

Provinces develop comprehensive policies on waste management systems and standards for environmental protection **These do not apply on Reserve creating a **regulatory gap**

Effective waste management regimes

- Adequate, long term financial resources,
- Human capacity – training, commitment, enforcement,
- Mechanisms to monitor and enforce compliance to rules and standards,
- Compliance promotion,
- Performance standards,
- Education and awareness,
- Administrative capacity.

Waste Management Tip

Consider creating educational resources about the importance of protecting your community from illegal dumping as a key approach to healthy land stewardship. You may also consider creating roles for individuals to become guardians who actively patrol for instances of illegal dumping in First Nation communities and traditional territories.

Common Approaches & Theories

Waste minimization and diversion

The United Nations Environment Program (UNEP) states:

"the solution, in the first place, is the minimization of waste. Where waste cannot be avoided, recovery of materials and energy from waste as well as remanufacturing and recycling waste into usable products should be the second option"

More effort must be made at the manufacturing level to prevent the creation of waste

Common Approaches & Theories

Reduce the amount of waste generated and the risk of pollution
Reuse materials as many times as possible, extending the lifespan as long as possible (repurposing or repairing)
Recycle materials by collecting, sorting and returning them to become something new

paper and cardboard,
plastic,
glass,
metals, &
organics (composting and vermiculture)

Common Approaches & Theories

Recovery is a method used to produce energy from solid waste when materials cannot be reused or recycled. Energy from waste is produced through:

- Incineration
- Gasification
- Thermal chemical reactions
- biofuels

Common Approaches & Theories

- **Residual** materials are the remaining garbage that cannot be salvaged through other uses and are destined to landfill.

- Employing sustainable practices in waste management can reduce the amount of waste in landfills and the need to extract more resources from Mother Earth

Waste Management Operators

At least one operator to be onsite during operating hours

Operators should be trained and certified in the following:

- Waste Management,
- First Aid,
- Health & Safety standards,
- Workplace Hazardous Materials Information System (WHMIS),
- Hazardous waste management,
- Ozone depletion prevention,
- Transportation of dangerous goods,
- Heavy equipment operation, and
- Wildlife safety

Waste Management Operators

Operators should be provided personal protective equipment (PPE)

- CSA approved safety boots that have steel or composite toe and are chemical resistant,
- Eye protection,
- Gloves,
- Hard hat,
- Respiratory gear with appropriate filters (dust and volatile organic compounds VOCs),
- Safety vest,
- Coveralls.
- Access to eye wash station, first aid kit and fire extinguisher are necessary

Advisory committee

Best Practice

Communicate regularly with Chief and Council throughout planning process.
The project progress will move smoothest if Chief and Council passes a BCR to recognize the authority of the advisory team to implement action steps.
Choose a consistent date and time to meet to establish a rhythm for planning.
Establish clear roles and responsibilities, along with short and long-term goals.
Select key dates to stay on track with meeting goals.
Discuss when and how to communicate with the community as a whole.

Other best practices

- Engage leadership and staff from neighbouring municipalities,
- Communicate with engineers, transport companies, environmental experts, non-profit organizations and educators,
- Communicate with Elders, youth and community members early and often,
- Identify waste management champion(s)

Wildlife – Best Practices for protection

Issues

- Loss of habitat
- Contamination
- Human disturbance
- Climate change

Best practice

- Map habitat availability
- Protect sensitive features; salt licks
- Protect water sources
- Avoid over hunting or harvesting
- Participate in species protection programs under *Species at Risk Act*

Wildlife protection BPs continued

- Work alongside Universities, non-Government organizations and other agencies to provide traditional knowledge and expertise
- Participate in the duty to consult to ensure projects are planned, constructed and operated in a manner that will protect wildlife
- Advocate for protection of wildlife habitat off Reserve
- Encourage land users to practice rights far & wide
  - Seek information regarding habitat and animal health observed by land users
- Implement a guardian program

Vegetation – pollution prevention Best Practices

Issues

- Weeds
- Herbicides and chemicals
- Contamination
- Over harvesting
- Water flow
- Biodivesity
- fragmentation

Best practice

- Hand manage weeds as much as possible, mow or employ goats
- Use green products to control weeds
- Do not allow weeds to seed, pull or treat before flowering
- Ensure all chemicals and hazardous materials are stored properly

Vegetation Management BPs continued

- Monitor traditional use sites to ensure plants remain healthy and seed source is maintained – prevent over harvest
- Restore lands that will be cleaned up upon termination of use – utilize native species, relocate or transplant plants from other locations (be mindful of soil type, topography etc)
- Protect water from contamination
- Protect soil from erosion and contamination
- Provide avenue for land users to share observations ie: app, social media

Environmental Management tools

- Environmental Management Plan
- Environmental review process
  - Environmental impact assessment
- Environmental Site Assessment
  - Phase 1, 2 & 3
- Environmental Audits

Environmental Management Planning

- An Environmental Management Plan serves as a guide to Chief & Councils, Lands Managers, other members of the management team and the community members to achieve desired environmental outcomes relating to land use, economic development, culture and way of life and health & wellbeing

Tools: Environmental Review

- A process used to understand how a proposed project will impact the environment, socio-economics and health
- The assessment will identify specific impacts to VECs
- Identification and recommendation of mitigation measures to reduce impacts, alteration of the plan to avoid impacts and compensation or offsets where impacts cannot be avoided
- The ER will provide information necessary to draft appropriate terms and conditions for permits and leases
- Monitoring for compliance is a critical best practice

Environmental Site Assessment

- Applicable to **Land Tenure**, and required by some *Indian Act* permits

- A process to study:
- How past and present activities have the potential to contaminate the land.
- How contaminants move around, degrade, and/or persist on the land.
- How contaminates affect human and ecosystem health.
- How contaminates can be cleaned up (remediated) and/or managed.

- Necessary to document the status of the land upon issuing a permit, and to ensure the condition of the land meets the pre- existing condition upon permit closure.

Tools: Environmental Site Assessment

A tool used to evaluate the condition of the land for land transfer, change in land use, administering land tenue, identifying and managing contamination on lands, Indian Act land tenure instruments, requests where land and environmental status is unknown.

ESA is a valuable tool in understanding and managing environmental risk and liability prior to committing resources towards a specific initiative, closing permits, etc.

Phases of an ESA

- Phase 1 – desktop review
  - research existing documents, records,
  - interview of land user, employees, managers, elders,
  - Map and air photo reviews including satellite imagery
- Phase 2 – ground truthing
  - When phase 1 determines the potential for contamination or impact
  - Preliminary ground truthing – soil and water sampling, vegetation health
  - Confirms presence of contamination
- Phase 3 – delineation
  - Extent – depth and breadth of contamination determined
  - remediation plan informed

Tools: Environmental Audit

- A tool used to evaluate environmental practices of a proponent on existing lands or infrastructure assets, and typically required prior to renewing leases / permits, additions to infrastructure, and other cases where confirming the environmental performance is necessary prior to issuing/amending lands instruments.
- These tools are regulated under the *Canadian Environmental Protection Act*, and the Alberta *Environmental Protection and Enhancement Act*.

Training requirements to promote Best Management

- First Aid
- Workplace Hazardous Materials Information Systems (WHIMS)
- Plant identification
- Soil and water sampling protocols
- Environmental legislation, regulations, standards and codes of practice
- NALMA - Environmental Management, Waste Management, Contaminated Sites training
- Wildlife hazards and safety programs
- BEAHR – Building environmental Aboriginal Human Resources
- Equipment operation – heavy, off-road vehicles, mowers etc.

Develop policy & procedures

- Land Use Planning
  - Zoning/by-laws
- Comprehensive Community Plan
- Waste Management plan
  - By-law
- Environmental Management Plan
  - Environmental review process, site assessments, audits
- Environment or Sustainability Policy
- Climate Change policy
- Safety Policy
- Consultation Policy
- Compliance checklists for all departments
- Household management training or workshops for residents

Procedures

- Waste handling, sorting and shipping
- recycling
- Hazardous and medical waste handling
- Soil handling procedures
- Water management/protection plan
- Implement standardized terms & conditions for permits/leases
- Integrated management – multiple departments play a role:
  - Housing and public works
  - Health
  - Recreation
  - Lands
  - Economic development

Record keeping

Good record keeping will

1. assist in promoting compliance
2. Identify problems or issues before they become unmanageable of expensive
3. Promote due diligence
4. Forms a record of defence in the case of non-compliance, an incident or litigation
5. Protect your First Nation from liability

Record management

- Should be specific to site or location
- Define or describe the site/location and activity (site conditions)
- Identify staff along with roles & responsibilities of each, along with their role in record keeping
- Dates of entries
- Record non-compliances and incidences along with responses and actions taken and by whom
- Safety requirements
- Successes

Data and information management

- Mapping – GIS
  - Identify sites of cultural significance
  - Zoning
  - Topography
  - Water flow
  - Habitat availability
  - Land use – housing, infrastructure, agriculture, etc
- Document storage – cloud, server etc
  - Secure, centrally located, accessible by all management and staff that need it

Community Awareness

Community awareness and involvement will promote a healthy environment and will support shared responsibility.

Community awareness is the responsibility of everyone:

- Chief & Council – provide direction and support
- Administration & Department heads and staff – ensure EM is included in their work
- Community members – hold themselves and each other accountable
- Lessees and permit holders – compliance with environmental laws and standards

Community engagements

- Inclusive,
- Gather initial insight to the issues, opportunities and goals of community,
- Elders have information of historic sites,
- Draft a community survey,
- Invite comments, ideas and recommendations.

it is important to demonstrate that all are heard and considered, community participation and ownership influences the success of the plan

Best Practices to promote community involvement

- Meet early and often
- Provide incentive to participate – door prizes, meals, honoraria
- Allow safe space for all to raise concerns, share experiences, offer ideas and solutions
- Have more than one individual taking minutes; record the sessions when possible
- Have Chief & Council present
- Diverse representation of members – elders, youth, women, men, two-spirit

Community involvement continued

- Use a variety of methods to reach people:
  - Posters at all public buildings – band office, gas station, health centre etc
  - Ads in newspaper
  - Radio
  - Social media
- Use surveys or questionnaires for people that do not like to participate in gatherings
- Find ways for community involvement – being part of the story adds to the success
- Promotes success stories

We are stewards of the land

When the whole community is informed, aware and involved Environmental Management becomes easy and a way of life!

~ Hai hai, meegwich, marsi cho, kinaniskomtinan ~

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