



# **Temporary onsite wastewater treatment systems at work camps**

Guidance Document

*Alberta* 

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Temporary Onsite Wastewater Treatment System at Work Camps | Municipal Affairs

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Due to the temporary nature of work camps it is difficult to apply the Alberta Private Sewage Systems Standard of Practice (SOP) to this industry. Municipal Affairs has developed this guidance document to clarify existing and new requirements for sewage treatment and disposal systems in the work camp industry. This guidance document applies to daily sewage effluent volumes of less than 25 metre<sup>3</sup> (5500 Imperial gallons). Greater effluent volumes (more than 25 metre<sup>3</sup>) are under the jurisdiction of Alberta Environment and Parks. The guidance document applies to the existing work camp variance holders, new variance applications, and management plans. These guidelines ensure consistent requirements are maintained and enforced throughout the work camp industry.

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# Part 1: Scope

The intent of this guidance document is to establish requirements for design, installation, site selection, performance objectives, materials and equipment for temporary on-site wastewater treatment system designs. This includes requirements for:

- initial treatment of wastewater
- final treatment of wastewater in soil
- containment of wastewater and treated effluent
- risk of contact with wastewater or treated effluent
- operational control of a system and,
- structural adequacy of a system.

Achieving these requirements will result in a temporary on-site wastewater treatment system that reduces the risk to public health and the natural environment to a level deemed acceptable.

This guidance document will consider:

- systems serving temporary work sites and work camps that generate up to 25 metre<sup>3</sup> (5500 Imperial gallons) per day of wastewater volume;
- the wastewater is of a strength greater than typical wastewater; and,
- treatment objectives that require disinfection or nutrient reduction components in the treatment train.

All private sewage undertakings at work camps or work sites must have the following:

- Permission from the land owner – on Crown land a Temporary Field Authorization or Disposition must be obtained by the lease holder
- Certified Equipment - equipment variance from Municipal Affairs
- Certified Private Sewage Installer – to oversee the installation of the equipment
  - Private Sewage Permit – obtained from the Authority Having Jurisdiction (Accredited Municipality or Alberta Safety Codes Authority)

This guidance document sets out specific requirements for temporary:

- lift stations
- holding tanks
- wastewater treatment plants
- open discharge systems
- enhanced surface discharge systems and,
- earthen privies (limited access work camp).

This guidance document does not apply to:

- permanent residential onsite wastewater systems
- permanent commercial onsite wastewater systems
- wastewater lagoons
- privies (with holding tanks)
- recreation vehicles (mobile trailers)

The use of open trenches, open sumps or open pits of sewage is not an acceptable practice for the disposal of wastewater.

This guidance document does not provide or imply any assurance or guarantee about the life expectancy, durability, operating performance, or workmanship of the equipment, materials, or undertaking. This is the responsibility of the owner / installer of the system.

Questions or concerns with the operation of a work camp or work site wastewater system may be directed to the following:

- Municipal Affairs – Technical and Corporate Services – Phone: 1-866-421-6929
  - Duty officer to answer questions about requirements of the Alberta Private Sewage Systems Standard of Practice.
- Alberta Environment and Parks – Phone: 1-800-222-6514
  - To report spills or environmental concerns.
- Alberta Health Services – Phone: 811
  - Public Health Inspectors – food handling permits, public health concerns, accommodation inspections.



## Part 2: Definitions and clarifications

**Administrator** - an administrator appointed pursuant to Section 14 of the *Safety Codes Act* as lead for the private sewage discipline.

**Authority Having Jurisdiction** – an accredited municipality or the Alberta Safety Codes Authority in accordance with the *Safety Codes Act*.

**Building** – any structure used or intended for supporting or sheltering any use or occupancy that is subject to the Alberta Building Code requirements.

**Carbonaceous biochemical oxygen demand (cBOD<sub>5</sub>)** – the amount of oxygen (expressed as milligrams/litre) utilized by micro-organisms in the non-nitrogenous oxidation of organic matter in wastewater during a five-day period at a temperature of 20°C (68°F). This measure is typically used for effluent samples.

**Chamber treatment system** – a system of effluent dispersal and treatment using preformed structures to provide a void space for storage and movement of effluent, and an interface with the exposed infiltrative surface of the soil.

**Commercial kitchen** – a kitchen that serves food to the public or workers (staff or employees). Commercial kitchens typically require a Food Handling Permit from Alberta Health Services.

**Dwelling or Dwelling unit** – a suite operated as a housekeeping unit that is used or intended to be used as a domicile by one or more persons and usually contains cooking, eating, living, sleeping, and sanitary facilities.

**Earthen privy** – a system used to dispose of human waste with an enclosed excavated pit. An earthen privy should only be used at work camp with written authorization from the Private Sewage Administrator. An earthen privy should only be used at work camps not accessible by road (example: fly in camps).

**Effluent** - the liquid discharged from a wastewater treatment system component.

**Enhanced surface discharge system** - a system designed to disperse secondary treated effluent over a larger ground surface to accomplish evaporation and absorption of the effluent into the soil as a method of treatment. This system uses pressure distribution in a lateral pipe system placed on the undisturbed ground surface. This system uses a chamber-type system with wood chips or other suitable material to cover the infiltration chambers to prevent freezing and environmental health exposure to the treated sewage.

**High strength wastewater** – the raw influent wastewater from a work camp that is projected or measured to be greater than the following values:

- cBOD<sub>5</sub> of 220 milligrams/litre,
- TSS of 220 milligrams/litre, and
- oil and grease content of 50 milligrams/litre

**Holding tank** – a tank designed to retain wastewater or effluent until transferred into mobile equipment for treatment offsite. Holding tanks need to meet or exceed CAN/CSA-B66 Standard. An equipment variance and a management plan from Municipal Affairs is required to operate and maintain sewage holding tanks in Alberta.

**Litter, fermented, humic (LFH) at-grade system** - a system for the dispersal and final treatment of effluent that:

- is located in a well-established forested area having a substantial LFH layer,
- has a pressurized effluent distribution lateral pipe system that is placed on the surface of the undisturbed forest floor inside a chamber, and
- has wood chips, or other material that is suited to the ecology of the forest, covering the chambers.

**Lift station** – a tank and pump assembly used for the prime purpose of lifting sewage to higher elevation and discharging it into other parts of the temporary onsite wastewater treatment system. A lift station is used to gather and transfer sewage to a larger containment tank or treatment system.

**Management Plan** – a document in which an organization commits to the components and details outlined in the plan. The plan must also outline the safety policies, standards and the process for ensuring compliance.

**Open discharge system** – a system designed to discharge secondary treated effluent to a single point location. The effluent is discharged to the ground surface to accomplish evaporation and absorption into the soil as a method of treatment. An open discharge system must be designed to minimize the pooling of effluent and minimize erosion on the ground surface.

**Organic loading** – the total mass loading per unit of area per unit of time based on the cBOD<sub>5</sub> concentration in the effluent, multiplied by the volume of effluent applied over a given time e.g., grams of cBOD<sub>5</sub>/metre<sup>2</sup>/day. Organic loading can be calculated with the following equation:

- $$[(\text{Peak flow}(\text{metre}^3/\text{day}) \times \text{cBOD}_5(\text{milligrams}/\text{litre}) / (\text{lateral length}(\text{metre}) \times \text{chamber width}(\text{metre})))] = \text{milligrams}/\text{metre}^2/\text{day}$$

\*Note divide milligrams/metre<sup>2</sup>/day by 1000 to convert to grams/metre<sup>2</sup>/day  
\* See Part 13 for examples

**Permit** – a private sewage permit is required from the municipality, certifying body or an accredited agency for a private sewage disposal system undertaking. The permit is required to ensure the installation of the system is done to the requirements of this document. The permit is also required for tracking the use of the sewage systems for future development. Authorization or permission to discharge treated wastewater must be obtained from the landowner. On crown land, the lease holder must obtain authorization or permission from Alberta Environment and Parks, Alberta Agriculture and Forestry or the Alberta Energy Regulator. Authorization must be obtained prior to utilizing any of the methods outlined in this document for wastewater management.

**Pooling (ponding)** – treated wastewater that has been pumped to the soil-based treatment area and is unable to absorb into the ground surface. This is an indication that the soil is saturated and is unable to absorb the treated effluent at the rate that is being applied to the soil surface. If pooling of effluent is taking place, the treatment field may need to be increased in lateral length or the soil may not be suitable for a soil-based treatment system. If the latter, then sewage holding tank must be used to avoid the pooling of effluent. A site with a zero slope increases the risk of pooling of effluent and a soil-based treatment system should be avoided.

**Private sewage installer** – a person who holds a valid Private Sewage Installer Certificate of Competency issued pursuant to the *Safety Codes Act*.

**Primary treatment** – physical treatment processes involving removal of particles, typically by settling and flotation with or without the use of coagulants; (e.g. a septic tank provides primary treatment)

**Professional engineer** – a professional engineer registered in Alberta, as defined in the *Engineering and Geoscience Professions Act*.

**Recreation vehicle** – also referred to as a mobile trailer or camping trailer, recreation vehicles have integral factory installed tanks for potable water and sewage. Recreation vehicles are assembled in a factory and evaluated to the CSA Z 240 Standard. A recreation vehicle is not required to meet the requirements of this document unless it discharges the sewage from the integral factory tanks into a separate holding tank or onsite treatment system at the work camp or work site.

**Secondary treated effluent** – effluent that has been treated through a sedimentation and biological process to remove dissolved and suspended organic matter. The effluent must meet (at least 80 percent of the time) the effluent quality parameters set out in Table 4,5,6,7 and 8 (of this document) for secondary treated effluent.

**Sewage** – the composite of liquid and water carried wastes associated with the use of water for drinking, food preparation, washing, hygiene, sanitation or other domestic purposes, but does not include wastewater from industrial processes.

**Shutdown or Rigout** – the event when a sewage treatment or containment system is taken out of service and disconnects from the plumbing system of a temporary work camp.

**Soil** – a naturally occurring, unconsolidated mineral or organic material at the earth's surface capable of supporting plant growth. Its properties usually vary with depth and are determined by climatic factors and organisms, as conditioned by relief and hence water regime, acting on geologic materials and producing genetic horizons that differ from the parent material.

**Soil-based treatment system** – the physical location where the dispersal of effluent to the soil and final treatment of the effluent occurs in the soil. A component of the system that provides treatment through biological processes.

**Start up or Rig up** – when a sewage treatment or containment system is connected to the plumbing system of a temporary work camp and put into service.

**Temporary wastewater treatment plant** – is a portable (relocatable) structure intended to provide secondary (or greater) treatment to the high strength wastewater created from a work camp. High strength wastewater is generated from the commercial type kitchen and due to the concentrated sewage from high efficiency plumbing fixtures. In addition, the wastewater has additional peak flows generated from the 24-hour operations in most work camp situations. The system must be designed and installed in a manner that does not present a risk to public health and does not cause degradation to the environment.

**Temporary work camp** – is a short-term dwelling for commercial or industrial workers consisting of relocatable structures designed to be moved.

**Total suspended solids (TSS)** – the dispersed particulate matter in a wastewater sample that may be retained by a filter medium. Suspended solids may include both settleable and un-settleable solids of both inorganic and organic origin. This parameter is widely used to monitor the performance of the various stages of wastewater treatment, and is often used in conjunction with BOD<sub>5</sub> and cBOD<sub>5</sub> to describe wastewater strength.

**Vac-out** – transferring or removing the contents of a sewage treatment or containment system with a vacuum truck (mobile tank truck) and disposing of the contents at an approved offsite treatment facility.

**Variance** – a written document that allows an alternate solution from the Alberta Private Sewage Systems Standard of Practice. The deviation must be able to provide an equivalent or greater amount of safety and performance to the original standard or code item. A variance or Management Plan from Municipal Affairs is required to operate uncertified temporary wastewater treatment systems and uncertified sewage holding tanks at temporary work sites and work camps. Wastewater treatment systems and sewage holding tank systems must have separate variances or management plans for the installation, maintenance, monitoring and use of temporary wastewater systems. These separate variances and management plans must be submitted separately to Municipal Affairs on a monthly or annually basis.

**Wastewater** – the composite of liquid and water-carried wastes generated from the use of water for drinking, cooking, cleaning, washing, hygiene, sanitation, or other domestic purposes; includes greywater, but does not include liquid waste from industrial processes.

**Water course** – (may be any of the following):

- a river, stream, creek, or lake
- swamp, marsh, or other natural body of water
- a canal, reservoir, or other man-made surface feature intended to contain water for a specified use, whether it contains or conveys water continuously or intermittently, but does not include surface water run-off drainage ditches, such as those found at the side of roads, or
- an area that water flows through or stands in long enough to establish a definable change in or absence of vegetation.

**Water source** – a man-made or natural source of potable water.

**Worksite** - the location where a worker is or likely to be engaged in any occupation. For the purpose of this document a worksite would also include the temporary shelter or building generating sewage from the workers onsite.

## Part 3: Temporary field authorization or disposition

A temporary field authorization is generally a short-term (under one year) conditional approval to use or occupy the public land (Crown land).

A Disposition is generally a long-term conditional approval to use or occupy the public land (Crown land) for specific purposes and activities.

Authorization or permission for the use of a wastewater management system or disposal system must be obtained from the landowner. Crown land and private land require permission from the landowner and compliance with this document.

On Crown land, a temporary field authorization or Disposition must be obtained by the lease holder prior to utilizing any of the methods outlined in this document for wastewater management. A temporary field authorization or a disposition can be obtained from the following:

- Alberta Environment and Parks
- Alberta Agriculture and Forestry
- Alberta Energy Regulator

Municipal Affairs and Alberta Environment and Parks share the responsibility of regulating wastewater management at work camps. The onsite disposal methods outlined in this guidance document apply to sewage effluent volumes of not more than 25 metre<sup>3</sup> (5500 Imperial gallons) per day under a private sewage permit or registration. Greater effluent volumes are under the jurisdiction of Alberta Environment and Parks under an *Environmental Protection and Enhancement Act* approval.

A private sewage permit (Part 6) is also required for all wastewater management or disposal systems.

As a condition/requirement of a temporary field authorization or disposition, this guidance document outlines the minimum requirements of the wastewater management at a temporary work site or work camp.

Failure to meet the conditions stipulated in the temporary field authorization or disposition and/or the requirements of this guidance document for the wastewater management at the temporary work site or work camp will result in the cancellation of the variance and/or management plans from Municipal Affairs. The cancellation of the variance and/or management plans will be reported to the leasing authority and/or municipality that the required wastewater approvals have been revoked and the work camp or work site is no longer in compliance with the legislative requirements.



## Part 4: Variance from Municipal Affairs

In general, the equipment in the Alberta Private Sewage Systems Standard of Practice is intended for a permanent wastewater installation that is below grade. Wastewater systems at work camps are temporary and are installed above grade. An approved variance from Municipal Affairs is required when the wastewater equipment does not meet the minimum standards noted in the Alberta Private Sewage Systems Standard of Practice.

Part 5 of this document discusses the Management Plan. A Management Plan is intended to manage the compliance monitoring and operational expectations of the wastewater systems, while the equipment variance is intended to manage the approval of the wastewater equipment.

The equipment variance for the temporary work camp provider will expire after a one-year period. The expiry date will be provided when the company initially receives the variance or receives the renewed variance with a new variance number.

The variance renewal request must be submitted one month prior to the variance expiry date.

The equipment variance is issued to a specified company or organization and is not transferable between companies or organizations. The equipment variance is for the named company on the variance to install and use the specified equipment; the equipment variance is not transferable between companies.

The sale and purchase of equipment must be tracked and include engineering documentation in the sale of the equipment. The purchased equipment (temporary wastewater treatment plants and holding tanks) will need to be registered and added to an existing variance before the equipment can be operated at a work camp or work site. The purchaser of the equipment will need to apply to Municipal Affairs to add the equipment to an existing equipment variance. If the purchaser does not have an existing variance, the purchaser will need to apply to Municipal Affairs for a new equipment variance.

Municipal Affairs maintains a list of companies and organizations that have an approved variance to operate at temporary holding tank and wastewater treatment systems at work camps. The list of approved variance holders will be posted on the Government of Alberta website at: <https://open.alberta.ca/publications/notice-private-sewage-systems-at-work-camps>. The equipment variance for wastewater treatment systems and holding tanks must meet the intent of the NSF 40 or BNQ 3680-600 (wastewater treatment plants) and/or CAN/CSA-B66 (holding tanks).

## 4.1 Equipment variance for temporary wastewater treatment plants

The equipment variance for temporary wastewater treatment plants is required when the wastewater treatment plants do not meet the requirements of the Alberta Private Sewage Systems Standard of Practice. Article 5.2.3.1 of the Alberta Private Sewage Systems Standard of Practice requires a wastewater treatment plant to be certified to NSF 40 or BNQ 3680-600 and/or CAN/CSA-B-66 standards. As the work camp industry uses alternate types of treatment plants, not in scope with the Alberta Private Sewage Systems Standard of Practice, an equipment variance is required.

The following are some of the conditions when an equipment variance is required for the temporary wastewater treatment plant system:

- Separation distances are unable to meet the requirement of the Alberta Private Sewage Systems Standard of Practice
- High strength wastewater requires an advanced treatment system
- Treatment systems are temporary and designed to be relocated
- Equipment and piping are above ground and required to be installed with protection from freezing
- Discharge into the environment can be achieved through an enhanced surface discharge soil-based treatment
- NSF 40 certification requirement on the treatment plant is not possible
- Structural integrity of the relocatable infrastructure needs to be verified by a professional engineer
- Maintenance procedures need to be reviewed to minimize failures in the system
- Validation of the treatment plant process and potential effluent quality needs to be conducted by a professional engineer

## 4.2 Equipment variance for sewage holding tank

The equipment variance for sewage holding tanks is required when the sewage holding tanks do not meet the requirements of the Alberta Private Sewage Systems Standard of Practice. Article 3.1.3.1 of the Alberta Private Sewage Systems Standard of Practice requires a sewage holding tank to be certified to the CAN/CSA-B66 Standard. As the work camp industry uses alternate types of sewage holding tanks, not in scope with the Alberta Private Sewage Systems Standard of Practice, an equipment variance is required.

The following are some of the conditions when an equipment variance is required for sewage holding tanks systems:

- Separation distances are unable to meet the requirement of the Alberta Private Sewage Systems Standard of Practice
- Containment systems are temporary and designed to be relocated frequently
- Equipment and piping are above ground and required to be installed with protection from freezing
- Maintenance procedures need to be reviewed to minimize failures in the system
- Validation of the structural integrity of the relocatable infrastructure structure needs to be verified by a professional engineer
- An engineer has assessed, reviewed and provided a report that the tanks meet the intent of the CAN/CSA-B66 Standard and are structurally sound during above ground operation

## Part 5: Management plan

A management plan is a document in which an organization commits to the components and details outlined in the plan. The plan should also outline the ongoing compliance monitoring, annual reporting, safety policies, standard operational expectations and the process for ensuring compliance. A plan will outline the responsibilities of the company or organization for the wastewater treatment systems and sewage holding tank systems.

A management plan must consist of the following:

- a statement committing senior management to the plan
- performance expectations of the systems
- procedures for sampling and reporting of results
- operational expectations of the equipment (e.g., effluent quality)
- process for tracking of private sewage disposal undertakings (tracking spreadsheets, permit templates, onsite inspection reports)
- corrective action procedures for incidents that cause non-compliant operation
- a strategy for compliance monitoring
- a strategy to ensure the risk to public health and the natural environment is acceptable
- procedures for installation, maintenance, monitoring, and decommissioning of the wastewater systems

A management plan acceptable to Municipal Affairs or the authority having jurisdiction is required in order to manage a temporary wastewater treatment systems and sewage holding tanks in the province. The plan applies to all wastewater treatment, sewage disposal systems and sewage storage systems at work camps and must be developed and submitted to Municipal Affairs by one of the following:

- Work camp operating company
- Wastewater system rental company
- Contracted wastewater system operator/company
- Private sewage installer.

Annually, a report will be generated and submitted to Municipal Affairs or the authority having jurisdiction for the renewal of the plan. (See Part 16)

A management plan must be developed for both a temporary and permanent work camp.

# Part 6: Permits

## 6.1 Private sewage permit

A private sewage permit is required for the installation of a wastewater treatment plant system (with soil-based disposal system) and sewage holding tank systems (sewage hauled to offsite disposal facilities).

A valid Alberta Private Sewage Installers Certificate of Competency number and a work camp variance or management plan that has been issued by Municipal Affairs is required to obtain a private sewage permit.

The permit application shall include the type of soil-based treatment method, treatment plant information, sewage holding tank information, site drawing, site evaluation, soil analysis (if required), directions to the location, contact information, and any other information deemed necessary by the permitting authority.

A private sewage permit application must be submitted to one of:

- an accredited municipality
- the Alberta Safety Codes Authority, which manages the permitting agencies in the non-accredited municipalities
- an accredited agency that is under the management of Alberta Safety Codes Authority
- an accredited organization that is approved by Municipal Affairs
- an agency deemed acceptable to the Private Sewage Administrator

Note: Contact Municipal Affairs at [safety.services@gov.ab.ca](mailto:safety.services@gov.ab.ca) or by phone at 1-866-421-6929 if you are unsure of how to obtain a private sewage permit or if require further information.

A temporary work camp permit has a maximum duration of 12 months and expires after 12 months from the issue date. If the duration of the temporary work camp is longer than one year, a new permit must be obtained and the soil treatment area (discharge location) must be relocated to a new location at a minimum of 15 metres (50 feet) away from the initial soil treatment area. Duration indicated how long a camp has occupied the same lease location and this may not be consecutive months.

A new permit for an existing system is required if the scope of work changes from the original permit. This may include a significant change in camp population, disposal area dimension changes, major equipment changes, moving equipment to a new location, ownership changes and any other significant change to the permit.

If a treatment plant or holding tank is present on one location for more than a nine-month period, the holder of the variance or management plan must notify Municipal Affairs of the upcoming expiry of the permit. The location of the temporary private sewage system may be subject to a site inspection by Municipal Affairs or the authority having jurisdiction to assess the site conditions.

A permit extension may be granted by Municipal Affairs to allow a transition period to a permanent approval from Alberta Environment (greater than 25 metres<sup>3</sup>) if the camp is expanded over the course of the year.

There must be a minimum of 12 months of inactivity (no discharge of sewage effluent) on an effluent disposal area before a location may qualify for a new temporary private sewage permit. During this period the soil will have time to rejuvenate to initial soil conditions.

The permit application must be posted onsite in a visible indoor common area within two weeks of the start-up date.

The approved permit document shall be posted onsite in a visible indoor common area within two weeks of receiving the approved permit from the permitting authority.

## 6.2 Self-compliance registration

A valid Alberta Private Sewage Installers Certificate of Competency number and a work camp variance or management plan that has been issued by Municipal Affairs is required to qualify for the Self Compliance Registration program.

Self-Compliance Registration through Municipal Affairs allows the operator to create a compliance inspection report for short term sites. In order to qualify for Self-Compliance Registration, a management plan will need to be generated by the applicant and be acceptable to the Private Sewage Administrator with Municipal Affairs. The following criteria must be met to qualify for self-compliance registration:

- work camp/worksites duration is fewer than 45 days;
- the work camp/worksites must be in a non-accredited municipality;
- peak daily effluent volume is less than 5.7 metres<sup>3</sup> (1250 Imperial gallons) per day

Note: A Private Sewage Permit (part 6.1) is required from an accredited municipality or an accredited agency Alberta Safety Codes Authority) if the above criteria is not achievable.

An annual report will be generated and submitted to Municipal Affairs. The report will contain onsite inspection reports performed by the applicant and a complete list of activity for each site.

The documentation will be reviewed and if deemed acceptable a renewal of the Self Compliance Registration will be issued.



# Part 7: Site evaluation

A site evaluation must be completed for all work camp locations. The site evaluation must document and evaluate the following:

Topography, landscape position of the system, vegetation, and surface drainage characteristics:

- The slope gradient and aspect of each landscape element shall be determined for each potential treatment site investigated
- Any vegetation type that favours wet or saturated soils shall be identified using its popular name, if known, and have its location identified in relation to the proposed system
- Any vegetation that will impact the selection of the location of the treatment system, or will require removal prior to construction of the treatment system, must be noted and
- Swales, depressions, and other drainage features that may impact system selection and design must be located and described

Surface waters and other natural features:

- Surface waters, including permanent or intermittent streams, lakes, wetlands, and other surface water within 100 metres (330 feet.) of the proposed system, must be located and described and
- Any other natural features within 100 metres (330 feet.) of the proposed system, that could impact the application and/or design of a treatment system must be located and described

An available area for construction of the on-site wastewater treatment system must be determined considering relevant horizontal separation distances (within 100 metres (330 feet.) of the proposed system), from features on the property or adjacent properties that may be required by this document and include:

- private water sources, water wells, or municipally-licensed water supply wells
- buildings or other property improvements including temporary buildings or dwellings
- property boundaries
- surface waters and floodplains and
- right-of-way and easements

Soil investigation must be completed for all work camp sites (see Part 8).

The preferred location of the effluent soil disposal system is within a treed area.

# Part 8: Soils - soil investigation

## 8.1 Duration of under six months and/or Peak Volume is under 5.7 metres<sup>3</sup> (1250 Imperial gallons.)

The following techniques can be used for soil identification:

- Hand texturing may be used to identify soil type for each site (soil cannot be frozen)
- Soils mapping, Agricultural Region of Soil Inventory Database (AGRISID) may be used in winter months to identify a soils type for each location
- Historical or baseline lease assessment data may be used to help identify soils for each location in winter months
- A soil sample does not require textural analysis at an accredited laboratory if the duration of the temporary work camp is under six months
- A method acceptable to the authority having jurisdiction

## 8.2 Duration is greater than six months and/or Peak Volume is greater than 5.7 metres<sup>3</sup> (1250 Imperial gallons)

Soil profiles must be investigated as described in the Alberta Private Sewage Systems Standard of Practice with the following exceptions:

- Two or more soil test pits must be investigated.
- A soil sample must be analyzed for texture from the limiting layer of a 900 millimetres (three feet) core soil sample or 900 millimetres (three feet) soil test pit
- The sample can be taken at any time during the first six months of operation of the work camp (from November 1 to March 31 a soil sample is not required, if soil is frozen)
- A bore auger test (core sampler) may be used to collect a soil sample
- The sample will be analyzed at an accredited laboratory for texture and the results must be reported to Municipal Affairs or the authority having jurisdiction during the annual variance renewal. (see Part 16.2)

An open discharge system must not be used on soils that have a soil texture classification of coarse sand, medium sand, fine sand, loamy medium sand, loamy coarse sand, within 900 millimetres (three feet) of the ground surface. The soil must also provide a vertical separation to saturated soils or groundwater of at least 900 millimetres (three feet).

An enhanced surface discharge system with an effluent quality of Level 1 or 2 (see Table 4 and Table 5) must not be used on soils that have a soil texture classification of coarse sand, medium sand, fine sand, loamy medium sand, loamy coarse sand, within 900 millimetres (three feet) of the ground surface. The soil must also provide a vertical separation to the water table or saturated soils of at least 900 millimetres (three feet) shall be maintained.

An enhanced surface discharge system with an effluent quality of Level 3 or 4 (see Table 6 and Table 7) does not have a restriction for soil texture however, a vertical separation to the water table or saturated soils of at least 900 millimetres (three feet) must be maintained in order to minimize effluent ponding.

# Part 9: Influent wastewater quality

Wastewater influent strength for work camps must have the minimum projected values:

- 600 milligrams/litre cBOD<sub>5</sub>
- 400 milligrams/litre TSS
- 200 milligrams/litre Oil and Grease

Note: The above projected values are to be used as an average value for designing a wastewater treatment system.

A deviation from the above values will need to be verified using supporting data to validate the claim for a reduced volume or strength of wastewater in the design. The supporting data must be submitted for approval to Municipal Affairs or the authority having jurisdiction over the land area.

## 9.1 High strength wastewater considerations

Wastewater influent strength values (above) are for design purposes. A higher concentration of wastewater may be present on certain locations. The design of the wastewater system must reflect the higher concentration of wastewater and supporting data must be provided.

The commercial kitchen at a work camp location produces a high strength wastewater that requires additional treatment with an advanced treatment system before it can be dispersed over an area of soil.

A grease interceptor (grease trap) that is designed and maintained for the expected flow rate may also be required if a commercial kitchen is present.

High efficiency water fixtures and water conservation due to the limited availability of potable water, contribute to the high strength influent at a work camp location.

## 9.2 Commercial kitchen

An onsite commercial kitchen produces high strength wastewater that requires additional treatment and will require the effluent to be dispersed over a greater surface area of soil.

An enhanced surface discharge system (Part 14.1) must be used if a commercial kitchen discharges wastewater into the temporary wastewater treatment plant, an open discharge system (Part 14.2) should not be used. Alternatively, a sewage holding tank system (Part 15.3) can be used if a commercial kitchen is present onsite.

## 9.3 Industrial wastewater

Industrial wastewater and industrial waste must not be added or pumped into the wastewater system. The industrial wastewater contains contaminants that could have a negative effect on the biological activity in the wastewater treatment plant system and the natural environment.

# Part 10: Effluent quality/sampling

The effluent quality of the temporary treatment plant shall determine the system performance. The effluent quality of the treatment plant shall also determine the options for the final soil treatment (See Part 13 and 14).

Effluent samples shall be obtained at a sampling port location between the final wastewater treatment plant component and the soil-based treatment.

Routine sampling of the temporary wastewater treatment plant effluent will be performed at every location at an interval of:

Daily wastewater volume	Sample interval
0 to 9 metres <sup>3</sup>	14 days (plus or minus five days)
9.1 metres <sup>3</sup> to 25 metres <sup>3</sup>	10 days (plus or minus four days)

Effluent quality must meet or exceed the values of tables 4, 5, 6, 7 and 8 at least 80 percent of the time.

Effluent quality that exceeds the values of tables 4, 5, 6, 7 and 8 will be deemed as non-compliant.

Effluent samples missed and taken past the required sample interval will be deemed as non-compliant.

Uncollected effluent samples will be deemed as non-compliant.

At least one compliant sample must be taken at each site from the treatment plant effluent regardless of the short-term duration.

A sample of the influent wastewater will be required to demonstrate the efficiency of the treatment process, as it compares to the final effluent quality when the peak daily peak flow of is between nine metres<sup>3</sup> to 25 metres<sup>3</sup>.

Peak daily volumes greater than nine metres<sup>3</sup> (2000 Imperial gallons) per day also require analysis of nutrient concentrations. The effluent samples must be analyzed for the following:

- Total phosphorus (TP).
- Nitrogen (Total).

\*see table 4, 5, 6 and 7 for nutrient quality levels.

All testing and analysis that is to be reported from tables 4, 5, 6, 7 and 8 must be performed at an accredited laboratory (except chlorine). Chlorine analysis must be performed onsite as a field assessment due to the short hold time. Additional field assessments and analysis may be performed for operational control purposes.

Effluent quality that exceeds the requirements of tables 4, 5, 6, 7 and 8 must be corrected within five days of receiving the sample results from an accredited laboratory. Commercial laboratory results must demonstrate that performance targets have been achieved. Municipal Affairs will be notified within 14 days of the resampled effluent, if the issue remains in non-compliance.

Equipment failures that cause non-compliant operation must be corrected within five days of becoming aware of the failure. Municipal Affairs will be notified within 14 days of the failure, if the issue remains in non-compliance.

# Part 11: Pooling of Effluent

The pooling or ponding of effluent in the soil treatment area is an indication the soil-based treatment system is not operating properly. The soil is not able to treat the volume of effluent at the hydraulic loading rate being discharged to the soil infiltration surface.

When pooling of effluent occurs and cannot be rectified, the soil treatment system will need to be relocated to an alternate location on the site with additional lateral length added to the original design. Increasing the lateral length will expand the soil infiltration surface area and must be done to address any ponding concerns. A soil sample will need to be collected in order to better assess the sizing requirements of the end soil treatment area.

If the pooling continues in the alternate area, a holding tank system will need to be installed at the site to contain the wastewater to avoid any health and environmental concerns.

Municipal Affairs will be notified within two days of a pooling (ponding) event in the discharge area. A remedial plan will be provided to Municipal Affairs that outlines the corrective actions that will be performed to address the issue. If the remedial action does not appear to address the concern to the satisfaction of Municipal Affairs, a site visit by Municipal Affairs might be undertaken.



## Part 12: Site Remediation

Site remediation must include the removal of all infrastructure from the temporary work camp location. This shall include the removal of the treatment plant, system chambers, lift stations and wastewater conveyance piping. Wood chip or mulch that was used to cover the infiltration chambers must be spread so the depth of un-compacted wood chips is fewer than six inches at time of spreading.

Untreated wastewater and sludge must be properly removed (vac-out) from site and disposed of at an approved offsite treatment facility.

The location must be decommissioned to a condition that does not pose a risk to public health or the natural environment.

Additional remediation requirements may be added to meet reclamation requirements outlined by Alberta Environment or local authorities. These are the minimum site remediation expectations for Municipal Affairs area of approval.

# Part 13: System design

There are four parameters that will impact the system design considerations and selection of the appropriate system:

1. Wastewater volume peak daily volume
2. Duration of the work camp
3. Effluent Quality (organic loading to soil)
4. Soil profile/conditions

The peak daily volume and the effluent quality the treatment plant technology is capable of achieving impacts the size of the soil treatment component

## 13.1 Wastewater volume

The peak occupancy of the temporary work camp is used to calculate the peak daily volume used to determine the size of the drainage system on each site location.

The peak daily volume of effluent shall be calculated at:

- 227 litres (50 Imperial gallons) per day per bed, **or**
  - 227 litres (50 Imperial gallons) per day per person
- (Whichever value is greater)

Example: 20 beds = 1000 Imperial gallons (4540 litres)

The volume is to be calculated using the greater value of either the number of beds or the number of permanent (constant) staff on the site.

The work camp or work site may have occasional staff that use the facilities at a location. These volumes are highly unpredictable and reductions or increases in peak daily flow volumes generated by occasional staff may be taken into consideration when calculating peak daily flow. Justification should be provided of how these variable flows have been addressed in the design.

If the peak daily volume is under three metres<sup>3</sup>/day (660 Imperial gallons) per day, an open discharge system may be employed as a soil-based treatment, if the soil conditions allow this type of system (see Part 14.1).

## 13.2 Duration

### Fewer than 45 days

If the duration of work camp or work site is expected to be fewer than 45 days, an open discharge system may be employed as a soil-based treatment (see Part 14.1).

Note: An open discharge system cannot be used if the work camp location has a commercial kitchen and if the peak daily flow of effluent is greater than three metres<sup>3</sup>/day (660 Imperial gallons/day).

### More than 45 days

If the duration of work camp or work site is expected to be more than 45 days, an enhanced surface discharge system may be employed as a soil-based treatment, if the soil conditions allow this type of system (see Part 14.2).

## 13.3 Effluent Quality

### Organic loading of effluent

The various treatment plant technologies offer a range of treated effluent quality. The effluent quality (measured by the cBOD<sub>5</sub> concentration) impacts the organic loading to the soil infiltration surface.

A treatment plant that has the ability to produce a better quality of effluent will be permitted to construct a reduced size of soil treatment system. (See Tables 1 to 7). The effluent qualities listed in Tables 4, 5, 6, and 8 must be achieved at least 80 percent of the time for the corresponding size of the soil treatment system.

The effluent strength and organic loading rate must not exceed the values for each level of treatment listed below:

- For Level 1 Treatment, the effluent organic loading to soil dispersal area shall not be greater than six grams of cBOD<sub>5</sub> per square metre per day based on peak daily flow volumes (with an effluent quality of under 40 milligrams/litre of cBOD<sub>5</sub>)
- For Level 2 Treatment, the effluent organic loading to soil dispersal area must not be greater than five grams of cBOD<sub>5</sub> per square metre per day based on peak daily flow volumes (with an effluent quality of less than 25 milligrams/litre of cBOD<sub>5</sub>)
- For Level 3 Treatment, the effluent organic loading to soil dispersal area must not be greater than four grams of cBOD<sub>5</sub> per square metre per day based on peak daily flow volumes (with an effluent quality of less than 15 milligrams/litre of cBOD<sub>5</sub>)
- For Level 4 Treatment, the effluent organic loading to soil dispersal area must not be greater than three grams of cBOD<sub>5</sub> per square metre per day based on peak daily flow volumes (with an effluent quality of less than 10 milligrams/litre of cBOD<sub>5</sub>)
- Organic loading (grams/m<sup>2</sup>/day) can be calculated with the following equation:

$$\text{Organic Loading} = \left( \frac{\text{Peak Flow} \times \text{Effluent Quality}}{\text{Lateral Length} \times \text{Chamber Width}} \right) \div 1000$$

Lateral Length (metres) can be calculated with the following equation:

$$\text{Lateral Length} = \left( \frac{\left( \frac{\text{Peak Flow} \times \text{Effluent Quality}}{\text{Chamber Width}} \right)}{\text{Organic Loading} \times 1000} \right)$$

## Organic loading examples

### Example # 1 - Solving for Organic Loading

- Organic Loading (grams) = ?
- Peak Daily flow (litres) = 10000 litres (2200 Imperial gallons)
- Effluent Quality (milligrams/litre) = 40 milligrams/litre CBOD<sub>5</sub>
- Chamber Width (metres) = 34 inches (0.86 metres)
- Lateral Length (metres) = 80 metres

$$\text{Organic Loading} = \left( \frac{\text{Peak Flow} \times \text{Effluent Quality}}{\text{Lateral Length} \times \text{Chamber Width}} \right) \div 1000$$

$$\text{Organic Loading} = \left( \frac{10000 \times 40}{80 \times 0.86} \right) \div 1000$$

$$\text{Organic Loading} = 5.8 \text{ g/m}^2/\text{day}$$

### Example # 2 - Solving for Lateral Length

- Lateral Length (metres) = ?
- Peak Daily Flow (Litres) = 21000 litres (4620 Imperial gallons)
- Effluent Quality (milligrams/litre) = 15 milligrams/litre cBOD<sub>5</sub>
- Chamber width (metres) = 34 inches (0.86 metres)
- Organic Loading (grams) = 4 grams/metres<sup>2</sup>/day

$$\text{Lateral Length} = \left( \frac{\left( \frac{\text{Peak Flow} \times \text{Effluent Quality}}{\text{Chamber Width}} \right)}{\text{Organic Loading} \times 1000} \right)$$

$$\text{Lateral Length} = \left( \frac{\left( \frac{21000 \times 15}{0.86} \right)}{4 \times 1000} \right)$$

$$\text{Lateral Length} = 91.6 \text{ meters}$$

# Part 14: Types of soil treatment systems

## 14.1 Open discharge – effluent treatment system

An open discharge system is a system designed to discharge secondary treated effluent to the ground surface to accomplish evaporation and absorption of the effluent into the soil as a method of treatment. The effluent is discharged from the outlet onto the ground surface.

The soil on which the wastewater effluent is discharged must, be protected from erosion caused by the discharge of effluent from the outlet.

The design of the open discharge system outlet and the landscaping of the area of the open discharge system must ensure the effluent does not migrate more than six metres (20 feet) before infiltrating into the ground.

The location of the effluent soil disposal system should preferably be within a treed area.

This is a single discharge point and is only intended for when the following occurs:

- The peak daily flow effluent volume is under three metres<sup>3</sup>/day (660 Imperial gallons)/day
- The work camp location has short duration of fewer than 45 days
- The work camp location does not have a commercial kitchen

\*see table 8.

### Separation distances

An open discharge system must not be located within:

- 50 metres (165 feet) of a water source, water well or water storage
- 100 metres (330 feet) from a licensed municipal water well
- 90 metres (300 feet) to a river, stream or lake
- 45 metres (150 feet) to all other water courses or surface waters
- 10 metres (33 feet) to a lease boundary or a property line and
- 45 metres (150 feet) to a building

## 14.2 Enhanced surface discharge – effluent treatment system

An enhanced surface discharge system is designed to disperse secondary treated effluent over a larger ground surface to accomplish evaporation and absorption of the effluent into the soil as a method of treatment. This method is similar to an (litter, fermented, humic) At-grade System but has been modified to accommodate a shorter lateral length.

The treatment system shall be constructed using the following:

- Laterals must have equal distribution of effluent
- The lateral(s) must be constructed from pipe and/or hose
- The lateral(s) shall must a minimum of 1/8 inch orifices that allow even distribution of effluent
- Orifices must be spaced at minimum distance of 0.6 metres (two feet) apart to a maximum of 1.5 feet metres (five feet) apart
- The lateral(s) must have a maximum length of 20 metres (65 feet) each
- An orifice(s) facing down must be used to allow drainage and prevent freezing. Orifice shields or an alternative method must be used on the downward facing orifices in the treatment system
- Laterals must be placed at a minimum two metres (six feet) apart
- Laterals must be covered with infiltration chambers
- Mulch, wood chips or an acceptable equivalent must be used as a cover material over the infiltration chambers
- Effluent quality must meet or exceed the values set out in table 4, 5, 6 and 7
- An alternative method deemed acceptable by Municipal Affairs may also be used for the dispersal of effluent into the soil

The effluent volume, effluent quality and the soils present at site determine the lateral length for each site. The effluent must be dispersed over a larger area in order to minimize the organic loading to the soil, help the absorption into the soil and not allow effluent to pool on surface. See table 4, 5, 6 and 7 for the organic loading for each level of treatment.

The location of the effluent soil disposal system should be within a treed area.

## Separation distances

An enhanced surface discharge system must not be located within

- 50 metres (165 feet) of a water source, water well or water storage
- 100 metres (330 feet) from a licensed municipal water well
- 90 metres (300 feet) to a river, stream or lake
- 45 metres (150 feet) to all other water courses or surface waters
- 6 metres (20 feet) to a lease boundary or to a property line, and
- 45 metres (150 feet) to a building

### 14.3 Earthen privy

An earthen privy can only be used at a work camp with written authorization (variance) from the Private Sewage Administrator. An earthen privy can only be used at work camps that are not accessible by road and are not accessible to the public (e.g. fly in camps).

An earthen privy is a wastewater disposal system used to dispose of human waste with a covered excavated pit.

The site specific earthen privy Variance will have the following conditions:

- The planned period of operation does not exceed four months
- The expected camp population does not exceed 50 persons
- The site location is within a non-accredited municipality in Alberta (does not administer the Private Sewage Disposal Regulation)
- If the location is in an accredited municipality, the municipality must formally agree to the application of this variance within their jurisdiction
- Any part of the soil-based treatment must not be installed in soils coarser than fine sandy loam
- At no point or time can the earthen privy pit exist in saturated soils or groundwater
- Non-organic material (plastic, etc.) must not enter the earthen privy pit



## Requirements of the system

- Earthen privies used for toilet facilities must be located to minimize any water surface drainage into privy pit
- The privy pit will be located on fine sandy loam or finer textured soils
- The pit dimensions will be approximately 1.0 metre width x 1.0 metre length x 1.2 metres depth
- The privy structure will include a door, natural lighting, seats, roof, walls and a toilet paper dispenser

## Separation Distances

The location of earthen privies used for toilet facilities must not be located within:

- 50 metres (165 feet) of a water source or water well
- 50 metres (165 feet) of a water course
- 50 metres (165 feet) of a kitchen or other place where food is stored prepared or consumed
- 45 metres (150 feet) from a dwelling or temporary structure (tent or building)

Earthen Privies used for kitchen sinks and shower (bathing) facilities must:

- be covered and fenced to prevent entry
- grease traps and sieves will be utilized to prevent grease and larger particles from entering the earthen privy
- be located to minimize any water surface drainage into privy pit
- have the privy pit located on fine sandy loam or finer textured soils, and
- have the privy pit dimensions of approximately 1.0 metre width x 10.0 metres length x 0.5 metre depth

The location of earthen privies used for kitchen sinks and shower (bathing) facilities must not be located within:

- 50 metres (165 feet) of a water source or water well
- 50 metres (165 feet) of a water course
- 10 metres (33 feet) of a kitchen or other place where food is stored prepared or consumed and
- 10 metres (33 feet) from a dwelling or temporary structure (tent or building)

## Reclamation of System

Earthen Privies must be back-filled with native soil material at the end of camp use. Soil must be mounded over the trench to accommodate settling. Additional reclamation requirements as set out by the Government of Alberta or company policies must be met.

# Part 15: System components

## 15.1 Piping

The conveyance of sewage must be done in a manner that provides no risk to human health or causes environmental damage.

Piping must be sufficiently supported to:

- prevent sagging
- withstand expected mechanical forces and
- withstand forces resulting from the movement of liquid in the system

Piping must not leak except where intended in the design.

The system design must prevent the freezing of liquids in the piping. Exterior (outdoor) piping must have the proper measures taken to prevent the sewage from freezing in the winter months.

Piping must be sloped and sized to accommodate the designed flow of wastewater or effluent and the drainage of piping when required to prevent freezing.

Piping must be approved for a pressure rating of at least 1.5 times the maximum pressure it may be subjected to by the system design.

## 15.2 Lift station tanks

The objective of a lift station is to store incoming wastewater, which is then periodically pumped to a higher elevation where it enters other components or sewer lines in the wastewater management and treatment system.

The design capacity and pumping controls used with the lift station must be capable of supplying small doses of wastewater to the downstream component so that large amounts of wastewater discharged at rapid transfer rates do not overload the capacity of the downstream components.

- A lift station must not leak or cause a risk to public health and the natural environment
- A lift station must be constructed of materials that are suitable to contain wastewater
- A lift station tank must have adequate means to protect the system from freezing while in operation and during periods of non-use

- The system design must consider the location to facilitate accessibility for service and maintenance.

Note: A lift station tank that is larger than 100 gallons (450 litres) will need to meet or exceed CAN/CSA-B66, "Design, Material, and Manufacturing Requirements for Prefabricated Septic Tanks and Sewage Holding Tanks." or a Professional Engineers approval.

## Separation distances

A lift station must not be located within:

- 10 metres (33 feet) of a water source, water well, or water storage
- 10 metres (33 feet) of a water course
- one metre (3.25 feet) of a property line
- one metre (3.25 feet) of a building and
- three metres (10 feet) of building or dwelling door, window or air intake when the lift station is vented or unsealed.

Note: A reduction to the separation distance to a building may be accepted in a Management Plan.

## 15.3 Holding tanks

A sewage holding tank is designed to retain wastewater or effluent until transferred into mobile equipment. Holding tanks need to meet or exceed CAN/CSA-B66, "Design, Material, and Manufacturing Requirements for Prefabricated Septic Tanks and Sewage Holding Tanks."

A temporary sewage holding tank that is used in the work camp industry is normally designed to be used above ground. An above ground sewage holding tank does not have the same type of protection and needs to be validated by the manufacturer or a professional engineer that:

- the tank can maintain its structural strength when installed above ground and
- the sewage holding tank and equipment will be protected from freezing and accidental impact.

A permanent sewage holding tank that is installed underground has the surrounding soil to insulate and provide additional strength to the sewage holding tank from collapsing when filled with liquid. The underground soil also protects the sewage holding tank from freezing and being ruptured by an impact.

- A sewage holding tank must have storage capacity suitable for the intended use. Consideration must be given to water usage, trucking capacity, and the intended frequency for pumping of the tank
- An equipment variance and management plan from Municipal Affairs is required to operate and maintain sewage holding tanks in Alberta
- A holding tank must have adequate means to protect the system from freezing while in operation and during periods of non-use
- A high-level alarm should be considered for the holding tank system. The system should include a mechanism or process of visually or audibly warning the user when liquid conditions are above the normal operating specifications
- A holding tank level-monitoring program may be considered as alternative solution to the visual or audible alarm
- Note: Visual levels must be taken from outside the tank, staff must not enter the tank for viewing of liquid levels
- Each holding tank unit will have
- a visible unit number clearly marked on the outside of the tank
- The company name and contact information must be clearly marked on the outside of the tank

The location of a sewage holding tanks must be selected with consideration to:

- accessibility for regular servicing
- accessibility for periodic removal of sludge and
- minimizing concerns with periodic odour problems that may occur, especially in high use/occupancy areas

## Separation distances

Holding tanks must not be located within:

- 10 metres (33 feet.) of a water source, water well, or water storage
- 10 metres (33 feet) of a water course
- one metres (3.25 feet) of a property line
- one metres (3.25 feet) of a building and
- three metres (10 feet) of a building or dwelling door, window or air intake when the tank is vented or unsealed

Note: A reduction to the separation distance to a building may be accepted in a Management Plan.

## 15.4 Wastewater treatment plants

A wastewater treatment plant must be used to treat the sewage from a work camp prior to the effluent being delivered to a soil treatment component.

A variance and management plan from Municipal Affairs are required to operate and maintain temporary wastewater treatment plants in Alberta. The wastewater treatment plant shall be validated by a professional engineer to verify that:

- the equipment and piping are protected from freezing and above ground use
- the structural integrity of the relocatable structure needs to be verified and
- the wastewater treatment plant process is capable of producing a consistently compliant effluent

The effluent quality from a temporary onsite wastewater treatment plant discharged to a downstream soil-based treatment system must meet or exceed the maximum allowable limits set out in tables 4, 5, 6, 7 and 8 (of this document) at least 80 percent of the time.

The required treatment capacity of a temporary onsite wastewater treatment system must consider the:

- expected peak hydraulic load
- expected influent strength of the wastewater
- extent of wastewater flow variation throughout a day and
- variations in wastewater flow from day to day

The location of a packaged sewage treatment plant should be selected with consideration to:

- accessibility for regular servicing
- accessibility for periodic removal of sludge and
- minimizing concerns with periodic odour problems that may occur, especially in high use/occupancy areas

An effluent filter must be installed on the treatment plant with a maximum pore opening of 1/8 inch. An effluent filter is not required if the final treatment method in the treatment plant is a type of filtration with less than 1/8-inch pore size (example: membrane treatment).

A temporary onsite wastewater treatment system must include:

- a pre-treatment system to remove influent solids from the sewage and
- a flow equalization tank or dosing tank on the effluent flow from the treatment plant to the soil treatment system

Additionally, a flow equalization tank or dosing tank may be used on the influent flow, prior to treatment to equally dose the influent over a 24-hour period.

Each wastewater treatment unit must have a visible unit number clearly marked on the outside of the tank.

The company name and contact information must be clearly marked on the outside of the wastewater treatment plants.

## **Separation distances**

A temporary sewage treatment plant must not be located within:

- 10 metres (33 feet) of a water source, water well or water storage
- 10 metres (33 feet) of a water course
- 6 metres (20 feet) of a property line
- 1 metres (3.25 feet) of a building
- 3 metres (10 feet) of a building or dwelling door, window or air intake when the tank is vented or unsealed.

## 15.5 Disinfection

Effluent from the treatment unit applied to the soil-based treatment method must have a maximum fecal coliform count of 50000 CFU/100millilitres (less than 9 metres<sup>3</sup>) and 10000 CFU/100 millilitres (greater than 9 metres<sup>3</sup>).

\*see tables 4, 5, 6, 7 and 8.

Disinfection may be achieved by the following methods:

- Chlorination tablets
- Sodium Hypochlorite liquid
- Filtration
- Ultra violet light
- Any other method deemed acceptable by the Private Sewage Administrator

Effluent from the treatment unit applied to the soil-based treatment method must have a maximum total chlorine concentration of 2 milligrams/litre.

De-chlorinating of effluent may be required when surface water is present with 90 metres (300 feet) of soil treatment component.

Note: Chlorine analysis must be performed onsite as a field assessment due to the short laboratory hold time.



# Part 16: Assessment and reporting

## 16.1 Site inspection

An inspection/assessment by a safety codes officer may be scheduled with the work camp variance holder, permit holder or the owner of the system to ensure compliance to this guidance document and compliance to the Variance/Management Plan issued by Municipal Affairs. The inspection must be scheduled with the company to ensure proper notification and arrangements can be made to allow access to the required areas. The site inspection must identify any deficiencies in the process and ensure the company is aware of all requirements.

A site inspection may also be necessary if a complaint, reason for concern, or public health risk becomes evident.

All financial costs associated with the site location assessment is the responsibility of the variance/management plan holder (e.g., corporation). This may include influent and effluent sampling or other water quality parameters needed to assess the treatment performance.

The inspection may consist of the following:

- Onsite Inspection (field assessment at an operational treatment facility)
- Sampling of effluent to do determine the quality of effluent
- Documentation review - laboratory analysis, field notes, permits
- Approved permits are posted onsite
- Site design of system matches permit application
- Sewage treatment system placement and techniques used for disposal
- Separation distances maintained (setbacks achieved)
- Soils investigation
- Camp populations and flow measurements
- Evidence of pooling of effluent in soil treatment area
- Health and public safety concerns

## 16.2 Annual reporting

An annual report must be written demonstrating the applicant's ability to comply with the terms of the variance/management plan and this guidance document.

The report must include the following information:

- Brief summary of company
- Unit/model # inventory of fleet for renewal (addition or deletions)
- Challenges and outcomes
- Discussion and comparisons of the data collected
- Engineering advancements
- Treatment Methods - Overview of wastewater treatment plants design
- Disposal Methods - Overview of process of conveying influent into the wastewater treatment plants and delivery process of the treated effluent into the environment
- Equipment validation documentation by a professional engineer (holding tanks or wastewater treatment systems)
- Detailed records of each installation as listed in Part 16.3

Municipal Affairs or the authority having jurisdiction may request a more frequent reporting of data for higher risk systems designs to ensure treatment performance has been achieved. This could include monthly reporting.

An applicant may also request a monthly reporting of data. The variance/management plan will follow an annual renewal process but a company or organization may choose to submit the data on a monthly basis.

An increase in reporting may also be required if poor performance is found in a previous year. This may also result in a refusal to renew a variance or management plan.

## 16.3 Form of annual report

A summary of the detailed information for each temporary work camp location must be submitted using an Excel spreadsheet

The spread sheet is to include the following:

- Private sewage permit number
- Unit number
- Effluent sample results for cBOD<sub>5</sub>, TSS, Fecal, Nitrogen, Phosphorus
- Legal land description or legal subdivision address
- Common name for the site location
- Contact information (onsite personnel) for the site location
- Site location population or occupancy
- Date of wastewater system start-ups, shutdowns, moves, vac outs
- Corrective actions performed for failures of the wastewater system
- Corrective actions for non-compliant samples or operation
- Maintenance performed to the wastewater system
- Brief description of the treatment plant process and soil treatment area (type and size)
- General comments
- Soil sample information (if applicable)

The report will be maintained by the variance holder and submitted to the Private Sewage Administrator prior to the one-year renewal date of the variance. Upon request at any time, the records will be made available to the Private Sewage Administrator for review.

## 16.4 Records inventory

Records must be kept by the company for review for a period of three years. The records will include the following information in the file.

- Camp population
- Identification number (model or serial number) of each unit in service
- Method of final effluent disposal to the environment
- A copy of the private sewage permit
- Legal subdivision address
- Inspection and maintenance reports
- Field service reports
- Sewage effluent testing results for cBOD<sub>5</sub>, TSS, and fecal coliform and show the time of day the sample was taken
- Start-up and Shut down periods
- Sludge and scum removal by vacuum tanker
- Descriptions of any non-compliant events and corrective action
- Soil sample analysis

These reports will be maintained by the variance/management plan holder and submitted to the Private Sewage Administrator prior to the one-year renewal date of the variance. Upon request at any time, the records will be made available to the Private Sewage Administrator for review.

# Part 17: Offences under the *Safety Codes Act*

## 17.1 Offences

67(1) A person who interferes with or in any manner hinders an Administrator or a safety codes officer in the exercise of the Administrator's or officer's powers and performance of the Administrator's or officer's duties under this Act is guilty of an offence.

(2) A person who knowingly makes a false or misleading statement under section 34(4)(c) either orally or in writing is guilty of an offence.

(3) A person who fails to prepare, submit or retain any information that the person is required by this Act to prepare, submit or retain is guilty of an offence.

(4) A person who

(a) contravenes this Act,

(b) contravenes a condition in a permit, certificate or variance,

(c) contravenes an order, or

(d) fails to carry out any action required in an order to be taken within the time specified in it, is guilty of an offence.

(5) A person who is guilty of an offence under this Act is liable on conviction for each day or part of a day on which the offence occurs or continues.

## 17.2 Penalties

68(1) A person who is guilty of an offence is liable

(a) for a first offence,

(i) to a fine of not more than \$100 000 and, in the case of a continuing offence, to a further fine of not more than \$1000 for each day during which the offence continues after the first day or part of a day, or

(ii) to imprisonment for a term not exceeding 6 months, or to both fines and imprisonment, and

(b) for a second or subsequent offence,

(i) to a fine of not more than \$500 000 and, in the case of a continuing offence, to a further fine of not more than \$2000 for each day or part of a day during which the offence continues after the first day, or

(ii) to imprisonment for a term not exceeding 12 months, or to both fines and imprisonment.

(2) If a person is guilty of an offence under this Act, the court may, in addition to any other penalty imposed or order made, order the person to comply with this Act or any order, permit, certificate or variance, or all or any one or more of them, as the case requires.

# Part 18: Cancellation of variance or management plan

A variance or management plan may be cancelled if an organization or company not comply with the terms, agreements, requirements or conditions of the Variance or Management Plan.

If warranted, Municipal Affairs or the authority having jurisdiction may also take the following action:

- Suspension of a variance or management plan. The suspension will be posted on the Government of Alberta website to inform permitting agencies and municipalities of the suspension
- Site inspections/assessments by safety codes officers
- Increased reporting of records to Municipal Affairs or authority having jurisdiction
- Increased maintenance or repairs to the system to protect public health or the natural environment
- Cancellation of the certified private sewage installer Certificate of Competency
- Penalties under the *Administrative Penalties Regulation*
- Penalties under the *Safety Codes Act*

# Tables

## Table # 1 – Sizing of effluent treatment system using organic loading (18 inch infiltrator chamber)

Daily Effluent Volume		Less than 40 mg/l cBODs (Level 1) Organic load not to exceed 6 g/m <sup>2</sup> /day		Less than 25 mg/l cBODs (Level 2) Organic load not to exceed 5 g/m <sup>2</sup> /day		15 mg/l cBODs (Level 3) Organic load not to exceed 4 g/m <sup>2</sup> /day		10 mg/l cBODs (Level 4) Organic load not to exceed 3 g/m <sup>2</sup> /day	
Daily flow (m <sup>3</sup> )	Daily flow (Imp. Gal)	Required Lateral Length (m)	Number of 20 meter laterals	Required Lateral Length (m)	Number of 20 meter laterals	Required Lateral Length (m)	Number of 20 meter laterals	Required Lateral Length (m)	Number of 20 meter laterals
1	220	16.4	1	12.3	1	9.2	1	8.2	1
2	440	32.8	2	24.6	2	18.5	1	16.4	1
3	660	49.2	3	36.9	2	27.7	2	24.6	2
4	880	65.6	4	49.2	3	36.9	2	32.8	2
5	1100	82.0	5	61.5	4	46.1	3	41.0	3
6	1320	98.4	5	73.8	2	55.4	3	49.2	3
7	1540	114.8	6	86.1	4	64.6	4	57.4	3
8	1760	131.2	7	98.4	5	73.8	4	65.6	4
9	1980	147.6	8	110.7	6	83.0	5	73.8	4
10	2200	164.0	9	123.0	7	92.3	5	82.0	5
11	2420	180.4	10	135.3	7	101.5	6	90.2	5
12	2640	196.9	10	147.6	8	110.7	6	98.4	5
13	2860	213.3	11	159.9	8	120.0	6	106.6	6
14	3080	229.7	12	172.2	9	129.2	7	114.8	6
15	3300	246.1	13	184.5	10	138.4	7	123.0	7
16	3520	262.5	14	196.9	10	147.6	8	131.2	7
17	3740	278.9	14	209.2	11	156.9	8	139.4	7
18	3960	295.3	15	221.5	12	166.1	9	147.6	8
19	4180	311.7	16	233.8	12	175.3	9	155.8	8
20	4400	328.1	17	246.1	13	184.5	10	164.0	9
21	4620	344.5	18	258.4	13	193.8	10	172.2	9
22	4840	360.9	19	270.7	14	203.0	11	180.4	10
23	5060	377.3	19	283.0	15	212.2	11	188.6	10
24	5280	393.7	20	295.3	15	221.5	12	196.9	10
25	5500	410.1	21	307.6	16	230.7	12	205.1	11

\*Organic loading can be calculated with the following equation: [(Peak flow x cBODs) / (lateral length X chamber width)]=g/m<sup>2</sup>/day

\*The above table used a chamber width of 16 inches (inside dimension)

\* Example: A daily effluent volume of 5m<sup>3</sup> (1100 Imp Gal) with less than 15 mg/L of cBODs would require 46.1 meters of laterals or three 20 meter laterals when using a 18 inch wide chamber



## Table # 2 – Sizing of effluent Treatment System Using Organic Loading (24 inch infiltrator chamber)

Daily Effluent Volume		Less than 40 mg/l cBODs (Level 1) Organic load not to exceed 6 g/m <sup>2</sup> /day		Less than 25 mg/l cBODs (Level 2) Organic load not to exceed 5 g/m <sup>2</sup> /day		15 mg/l cBODs (Level 3) Organic load not to exceed 4 g/m <sup>2</sup> /day		10 mg/l cBODs (Level 4) Organic load not to exceed 3 g/m <sup>2</sup> /day	
		Required Lateral Length (m)	Number of 20 meter laterals	Required Lateral Length (m)	Number of 20 meter laterals	Required Lateral Length (m)	Number of 20 meter laterals	Required Lateral Length (m)	Number of 20 meter laterals
Daily flow (m <sup>3</sup> )	Daily flow (Imp. Gal)								
1	220	11.9	1	8.9	1	6.7	1	6.0	1
2	440	23.9	2	17.9	1	13.4	1	11.9	1
3	660	35.8	2	26.8	2	20.1	2	17.9	1
4	880	47.7	3	35.8	2	26.8	2	23.9	2
5	1100	59.7	3	44.7	3	33.6	2	29.8	2
6	1320	71.6	4	53.7	3	40.3	3	35.8	2
7	1540	83.5	5	62.6	4	47.0	3	41.8	3
8	1760	95.4	5	71.6	4	53.7	3	47.7	3
9	1980	107.4	6	80.5	5	60.4	4	53.7	3
10	2200	119.3	6	89.5	5	67.1	4	59.7	3
11	2420	131.2	7	98.4	5	73.8	4	65.6	4
12	2640	143.2	8	107.4	6	80.5	5	71.6	4
13	2860	155.1	8	116.3	6	87.2	5	77.5	4
14	3080	167.0	9	125.3	7	94.0	5	83.5	5
15	3300	179.0	9	134.2	7	100.7	6	89.5	5
16	3520	190.9	10	143.2	8	107.4	6	95.4	5
17	3740	202.8	11	152.1	8	114.1	6	101.4	6
18	3960	214.7	11	161.1	9	120.8	7	107.4	6
19	4180	226.7	12	170.0	9	127.5	7	113.3	6
20	4400	238.6	12	179.0	9	134.2	7	119.3	6
21	4620	250.5	13	187.9	10	140.9	8	125.3	7
22	4840	262.5	14	196.9	10	147.6	8	131.2	7
23	5060	274.4	14	205.8	11	154.3	8	137.2	7
24	5280	286.3	15	214.7	11	161.1	9	143.2	8
25	5500	298.3	15	223.7	12	167.8	9	149.1	8

\*Organic loading can be calculated with the following equation:  $[(\text{Peak flow} \times \text{cBODs}) / (\text{lateral length} \times \text{chamber width})] = \text{g/m}^2/\text{day}$

\*The above table used a chamber width of 22 inches (inside dimension)

\* Example: A daily effluent volume of 5m<sup>3</sup> (1100 Imp Gal) with less than 15 mg/L of cBODs would require 33.6 meters of laterals or two 20 meter laterals when using a 24 inch wide chamber

## Table # 3 – Sizing of effluent Treatment System Using Organic Loading (36 inch infiltrator chamber)

Daily Effluent Volume		Less than 40 mg/l cBODs (Level 1) Organic load not to exceed 6 g/m2/day		Less than 25 mg/l cBODs (Level 2) Organic load not to exceed 5 g/m2/day		15 mg/l cBODs (Level 3) Organic load not to exceed 4 g/m2/day		10 mg/l cBODs (Level 4) Organic load not to exceed 3 g/m2/day	
		Required Lateral Length (m)	Number of 20 meter laterals	Required Lateral Length (m)	Number of 20 meter laterals	Required Lateral Length (m)	Number of 20 meter laterals	Required Lateral Length (m)	Number of 20 meter laterals
Daily flow (m3)	Daily flow (Imp. Gal)								
1	220	7.7	1	5.8	1	4.3	1	3.9	1
2	440	15.4	1	11.6	1	8.7	1	7.7	1
3	660	23.2	2	17.4	1	13.0	1	11.6	1
4	880	30.9	2	23.2	2	17.4	1	15.4	1
5	1100	38.6	2	28.9	2	21.7	2	19.3	1
6	1320	46.3	3	34.7	2	26.1	2	23.2	2
7	1540	54.0	3	40.5	3	30.4	2	27.0	2
8	1760	61.8	4	46.3	3	34.7	2	30.9	2
9	1980	69.5	4	52.1	3	39.1	2	34.7	2
10	2200	77.2	4	57.9	3	43.4	3	38.6	2
11	2420	84.9	5	63.7	4	47.8	3	42.5	3
12	2640	92.6	5	69.5	4	52.1	3	46.3	3
13	2860	100.4	6	75.3	4	56.4	3	50.2	3
14	3080	108.1	6	81.1	5	60.8	4	54.0	3
15	3300	115.8	6	86.8	5	65.1	4	57.9	3
16	3520	123.5	7	92.6	5	69.5	4	61.8	4
17	3740	131.2	7	98.4	5	73.8	4	65.6	4
18	3960	139.0	7	104.2	6	78.2	4	69.5	4
19	4180	146.7	8	110.0	6	82.5	5	73.3	4
20	4400	154.4	8	115.8	6	86.8	5	77.2	4
21	4620	162.1	9	121.6	7	91.2	5	81.1	5
22	4840	169.8	9	127.4	7	95.5	5	84.9	5
23	5060	177.6	9	133.2	7	99.9	5	88.8	5
24	5280	185.3	10	139.0	7	104.2	6	92.6	5
25	5500	193.0	10	144.7	8	108.6	6	96.5	5

\*Organic loading can be calculated with the following equation: [(Peak flow x cBODs) / (lateral length X chamber width)]=g/m2/day

\*The above table used a chamber width of 34 inches (inside dimension)

\* Example: A daily effluent volume of 5m3 (1100 Imp Gal) with less than 15 mg/L of cBODs would require 21.7 meters of laterals or two 20 meter laterals when using a 34 inch wide chamber

## Table # 4 – Effluent quality for Level 1 treatment

Table #4 - Effluent Quality for Level 1 Treatment		
Parameter	Maximum allowable limits for daily flow volume less than nine m <sup>3</sup>	Maximum allowable limits for daily flow volume greater than 9 m <sup>3</sup>
Organic loading to soil	6 grams cBOD <sub>5</sub> /m <sup>2</sup> /day	6 grams cBOD <sub>5</sub> /m <sup>2</sup> /day
cBOD <sub>5</sub>	40 mg/l	40 mg/l
TSS	45 mg/l	45 mg/l
Fecal coliforms	50000 CFU/100ml	10000 CFU/100ml
Total chlorine	2 mg/L	2 mg/L
Total phosphorus		50 % reduction
Total nitrogen		50 % reduction

## Table # 5 – Effluent quality for Level 2 treatment

Table #5 - Effluent Quality for Level 2 Treatment		
Parameter	Maximum allowable limits for daily flow volume less than 9 m <sup>3</sup>	Maximum allowable limits for daily flow volume greater than 9 m <sup>3</sup>
Organic loading to soil	5 grams cBOD <sub>5</sub> /m <sup>2</sup> /day	5 grams cBOD <sub>5</sub> /m <sup>2</sup> /day
cBOD <sub>5</sub>	25 mg/l	25 mg/l
TSS	30 mg/l	30 mg/l
Fecal coliforms	50000 CFU/100ml	10000 CFU/100ml
Total chlorine	2 mg/L	2 mg/L
Total phosphorus		50 % reduction
Total nitrogen		50% reduction

## Table # 6 – Effluent quality for Level 3 treatment

<b>Table #6 - Effluent Quality for Level 3 Treatment</b>		
Parameter	Maximum allowable limits for daily flow volume less than 9 m <sup>3</sup>	Maximum allowable limits for daily flow volume greater than 9 m <sup>3</sup>
Organic loading to soil	4 grams cBOD <sub>5</sub> /m <sup>2</sup> /day	4 grams cBOD <sub>5</sub> /m <sup>2</sup> /day
cBOD <sub>5</sub>	15 mg/l	15 mg/l
TSS	15 mg/l	15 mg/l
Fecal coliforms	50000 CFU/100ml	10000 CFU/100ml
Total chlorine	2 mg/L	2 mg/L
Total phosphorus		50 % reduction
Total nitrogen		50% reduction

## Table # 7 – Effluent quality for Level 4 treatment

<b>Table #7 - Effluent Quality for Level 4 Treatment</b>		
Parameter	Maximum allowable limits for daily flow volume less than 9 m <sup>3</sup>	Maximum allowable limits for daily flow volume greater than 9 m <sup>3</sup>
Organic loading to soil	3 grams cBOD <sub>5</sub> /m <sup>2</sup> /day	3 grams cBOD <sub>5</sub> /m <sup>2</sup> /day
cBOD <sub>5</sub>	10 mg/l	10 mg/l
TSS	10 mg/l	10 mg/l
Fecal coliforms	50000 CFU/100ml	10000 CFU/100ml
Total chlorine	2 mg/L	2 mg/L
Total phosphorus		50% reduction
Total nitrogen		50% reduction

## Table # 8 – Effluent quality for open discharge systems

Table # 8 - Effluent Quality for Open Discharge Systems	
Parameter	Maximum allowable limits for daily flow volume less than 3 m <sup>3</sup>
Organic loading to soil	N/A
cBOD <sub>5</sub>	40 mg/l
TSS	45 mg/l
Fecal coliforms	50000 CFU/100ml
Total chlorine	2 mg/L
Total phosphorus	N/A
Nitrogen (total)	N/A