8.0 INSPECTION, MONITORING AND FOLLOW-UP

This section describes the practices and programs SemCAMS has developed to ensure that the recommended protection measures and commitments made in the ESA are implemented throughout the construction and operation phases of the Project so that ecological integrity of the current environment affected by the Project is maintained and, where practical, enhanced. Information contained within this section addresses *Guide A.2.7 Inspection, Monitoring and Follow-up* of the NEB *Filing Manual* (2004).

8.1 Environmental Policy

A copy of the SemCAMS Health, Environmental and Safety (HES) Policy applicable to the Project is provided. This policy includes a commitment to:

> *"excellence in managing all of the health, environmental and safety aspects of our business and of the facilities that SemCAMS operates.*"

and applies to all phases of SemCAMS' work to serve as a guide for a healthy, environmentally responsible and safe work place. SemCAMS is committed to implementing the key principles contained in the HES Policy for the Project. It is applicable to SemCAMS Redwillow ULC as well as to all activities of SemCAMS' Affiliates.

Along with SemCAMS' commitment to the implementation of the HES Policy, SemCAMS has agreed to follow the mitigative measures presented in Sections 6.2, 6.3 and 6.5 of the ESA to minimize the risk of adverse environmental effects associated with the Project and to maintain, restore or enhance ecological integrity of the environment in the vicinity of the Project. In addition, SemCAMS has agreed to use the EPP (see Appendix 6A), which will be further developed for the Project and used as a guide for the construction of the Project.

8.2 Environmental Education During Construction

A draft environmental education program is outlined in Sections 8.2.1 through 8.2.4. This program is designed to ensure that all individuals involved in the construction of the Project understand the environmental requirements and their role and responsibilities with regard to meeting those requirements. The environmental education program, in association with safety training, will be provided to all construction personnel and visitors, and will consist of a variety of levels of environmental awareness and training. Construction personnel for the Project will include nonsupervisory and supervisory workers, as well as SemCAMS' Construction Supervisor, Environmental Inspectors and Activity Inspectors. Individuals will receive training commensurate with their roles and responsibilities. In addition to the standard, formal training provided in advance of construction, issue-specific or site-specific training, or refresher training will also be conducted as warranted. Records of environmental training provided to workers and visitors will be maintained. The proposed training programs are described below.

8.2.1 Basic Level - Nonsupervisory Construction Personnel and Visitors

Since all individuals, including visitors, have the potential to influence compliance with environmental commitments and contribute to maintaining ecological and commemorative integrity and to the principles of environmental stewardship, SemCAMS will devise a standardized means of imparting critical information regarding the environmental requirements of the Project to all workers and visitors. An Environmental Handbook will be produced and used for the basic level of environmental training. The handbook will be a concise pamphlet and will contain an overview of environmental issues and mitigation as well as the main "do's and don'ts" for the nondecision-making worker and visitor. Means of how individual's actions can contribute to ecological integrity and environmental stewardship will be discussed (*e.g.*, putting garbage in refuse containers, bear awareness and training) as will expectations of worker conduct. Copies of the handbook will be available onsite at the construction field office so that it can be given to visitors, upon their arrival, or to new hires on their first day of work. Upon completion of the basic level of training, the individual will be required to sign a form indicating that they have read and understood the handbook and will be issued a hardhat sticker signifying that they have completed the basic training. No person will be permitted to be on the Project site without a valid hardhat sticker.

SemCAMS
Health, Safety, and Environmental Policy

SemCAMS ULC and its subsidiary companies ("**SemCAMS**") are committed to excellence in managing all of the health, environmental and safety ("**HES**") aspects of our business and of the facilities that SemCAMS operates. We believe that the well being of our employees and the communities in which we operate is key to our success.

SemCAMS recognizes that HES is the responsibility of and owned by all people within the organization. Senior Leadership, Line Supervisors, Workers and Contractors at all levels will demonstrate leadership, open communication and participation to deliver superior health, environmental and safety performance.

SemCAMS is committed to:

Compliance assurance – We are committed to comply with all relevant legislation and regulations and other subscribed requirements while openly communicating and participating with regulatory bodies to seek opportunities and solutions addressing HES global impact issues;

Continual improvement – We will manage and support a healthy, environmentally responsible and safe workplace by identifying all HES aspects and impacts with appropriate controls and steps to improve them;

Safety and Health – We will aspire to work without injury and occupational illnesses and will routinely conduct workplace management reviews of our safety and occupational health practices to attain this goal. We are committed to working with contractors who share similar expectations;

Pollution prevention – We will routinely conduct facility management reviews to set objective and measurable targets for all functional groups, identifying significant HES aspects of our products, services and activities to ensure reduction or elimination of emissions, waste, discharges, and inefficient energy consumption;

Cooperative improvements – We will cooperate as appropriate with all levels of government, industry, the public and other institutions to support the research, development, and implementation of technologies that will reduce or eliminate the HES impact of our activities, products and services and to ensure responsible efficient use of natural resources.

HES progress communication – We will communicate regularly through open forums to our stakeholders on our policies and program effectiveness for HES management;

Corporate commitment – SemCAMS' leadership will routinely set and review corporate goals, objectives and targets complying with industry legislation and considering HES global impact issues and will recognize and reward individuals and groups demonstrating HES leadership & excellence. SemCAMS' leadership will routinely review this policy and HES management systems to ensure that they continue to meet the needs and expectations of our organization, stakeholders and other interested parties.

SemCAMS is in business for the long term and by fulfilling our health, environmental and safety responsibilities, we will share in the continuing benefits of a healthy, environmentally responsible and safe work place.

Darren Marine
President

October 1, 2007

8.2.2 Intermediate Level – Supervisory Construction Personnel and Inspectors

In addition to basic level training, supervisory construction personnel and SemCAMS-employed inspectors (*i.e.,* the decision-makers during the construction of the Project) will be required to complete a more comprehensive environmental training session prior to working on the Project. This intermediate level of environmental training will be provided through a classroom session conducted by SemCAMS' environmental staff or their designated representative. The curriculum for the intermediate level training will consist of a presentation and discussion of the following:

- SemCAMS' HES Policy;
- environmental issues and mitigative measures, and how to interpret the EPP and associated Environmental Alignment Sheets and details,
- contingency plans;
- decision-making procedures regarding environmental matters; and
- the role and responsibilities of the Environmental Inspector.

8.2.3 Advanced Level – Construction Supervisors and Environmental Inspectors

SemCAMS' environmental staff, or their designated representative, will conduct an advanced level environmental training program for the Construction Supervisors and Environmental Inspectors in order to prepare them for the specialized capacity in which they will be working. The advanced level of environmental training will consist of a review of Project documents and a classroom session. The advanced level environmental training curriculum will address the following:

- authority of Construction Supervisor and Environmental Inspector;
- SemCAMS' HES Policy and environmental compliance initiatives;
- environmental issues and mitigative measures;
- environmental issue resolution and the role of the Environmental Inspector as it relates to other supervisory / inspection personnel;
- contingency plans and the role of the Construction Supervisor and Environmental Inspector in the event of emergencies such as fires or spills;
- regulatory permits and approvals and other environmental commitments;
- regulatory liaison and associated requirements;
- stakeholder relations;
- site-specific and refresher training; and
- daily duties, reporting requirements and general procedural protocols.

The Construction Supervisors and Environmental Inspectors will be provided with copies of the ESA, EPP, Environmental Alignment Sheets, all permits and approvals obtained for the Project and other appropriate reference material (*e.g.,* water quality monitoring protocol). A library of applicable environmental Project documents and other reference material (*e.g.,* CCME documents for contaminated sites) will also be maintained in the Project field offices for use by Environmental Inspectors and other construction inspection/supervisory personnel.

In addition, specialized training for Environmental Inspectors will be provided. This will consist of information sessions provided by Project resource specialists (*e.g.,* botanists and foresters, wildlife

biologists, archaeologists) to develop or improve skills (*e.g.,* conducting an initial assessment of a suspected archaeological find during strippings salvage or trenching, identification of MPB and other forest health pathogens, etc.). By so doing, Environmental Inspectors will be better equipped to implement contingency plans to be contained within the EPP such as the Heritage Resource Discovery Contingency Plan. The Project resource specialists will be on call to assist the Environmental Inspectors as required.

8.2.4 Site-Specific Training and Refresher Training

Site-specific or issue-specific training provides an opportunity for on-the-spot reinforcement of awareness of environmental stewardship, special measures pertaining to sensitive areas or to activities with a high potential for adverse environmental impacts. Environmental Inspectors and other inspection/supervisory personnel will conduct this type of training whenever it is deemed to be necessary such as prior to instream work at sensitive watercourses. The overall plan of action including timing and responsibilities will be discussed. Special emphasis will be given to unusual issues or measures to be implemented. Contingency plans and the location of resources to deal with contingency events may also be reviewed at that time, if appropriate. Impromptu, informal training will also be undertaken where individuals or crews would benefit from refresher training.

8.3 Environmental Inspection

The Environmental Inspectors will monitor construction and prepare daily reports of activities and conditions. The environmental issues and the implementation of mitigative measures will be carefully monitored by the Environmental Inspector. If the mitigative measures are not found to be effective, the Environmental Inspector will consult with one or more of the following as required and as appropriate: Construction Supervisor; SemCAMS' staff and/or government representatives. The Environmental Inspectors will also be responsible for enforcing compliance with environmental commitments, approvals and permits, recommending additional or alternative mitigative measures, noting potentially adverse environmental effects, identifying site-specific issues, and determining the status of environmental issues following construction of the Project. Section 8.3.2 outlines a more detailed list of the roles and responsibilities of the Environmental Inspectors.

8.3.1 Environmental Inspection Program Description

The involvement in the Project of full-time, highly qualified and well-trained Environmental Inspectors is a key component of SemCAMS' environmental compliance strategy. The Environmental Inspectors will enforce continuous and consistent compliance with the ESA, EPP, all permit conditions, environmental laws and guidelines, and other environmental commitments. SemCAMS' staff will be available to the Environmental Inspectors for decision-making support and resolution of environmental resource issues arising onsite.

The Environmental Inspectors will report directly to SemCAMS' Construction Supervisor and indirectly to SemCAMS' Environmental staff or a designated representative. They will be recognized as an integral part of the construction management team. Their role will be well defined within the chain of command. The Environmental Inspectors will have crew shut-down authority for environmental reasons. A responsibility of the Environmental Inspectors will be to make recommendations to the Construction Supervisor with regard to environmental shut down (*e.g.,* wet conditions shut-down).

8.3.2 Environmental Inspector Qualifications and Duties

The Environmental Inspectors will have in depth knowledge of pipeline construction techniques and will take a preventative approach rather than a reactive approach to environmental issues. In addition, preference will be given to candidates with a post-secondary education in the natural sciences or other pertinent training. The Environmental Inspectors must have a demonstrated positive attitude toward environmental protection and a track record of successful environmental issue resolution resulting in satisfactory resource protection. In addition, the Environmental Inspectors will be supported by appropriate Resource Specialists who will be available onsite, when warranted, and have expertise in the

particular issues associated with the spread (*i.e.,* soil scientist, geotechnical engineer, wetland specialist, Registered Professional Forester, fisheries biologist, botanist, wildlife biologist, archaeologist, reclamation specialist, etc.).

In general, the Environmental Inspectors will be responsible for:

- ensuring familiarity with all Project related environmental documents and decisions and commitments relating to those documents;
- delivering basic level environmental training sessions;
- ensuring that work proceeds in compliance with all environmental commitments contained within the ESA, conditions of the NEB Certificate, other permits and approvals, as well as other environmental laws, regulations and guidelines that apply to the Project;
- working directly with other activity inspectors and contractor supervisory staff to assist in the interpretation and implementation of environmental mitigation and reclamation measures;
- monitoring of activities that could result in potentially adverse environmental effects and overseeing the implementation of mitigative measures specifically intended to minimize those effects;
- proactively identifying new environmental issues that may arise and recommending suitable mitigation;
- assessing the effectiveness of mitigative measures and recommending alternative measures, in consultation with SemCAMS' Environmental Coordinator and, where warranted, with government agencies such as DFO to achieve the desired result;
- providing advice and recommendations for major decisions, such as courses of action to deal with unexpected environmental conditions, including requiring work stoppage;
- suspending operations where unacceptable situations with serious environmental implications arise (*e.g.,* where fish or fish habitat may be at risk, where plant species of special status or bird nests are encountered or where there is substantial siltation of a watercourse or erosion of soils);
- implementing and ensuring compliance with contingency plans, as required;
- reporting any spills in accordance with federal and/or provincial regulations and providing advice with regard to the clean-up and disposal of the material and any affected soils or vegetation;
- coordination and facilitation of any water, soil and biological monitoring or sampling, if required;
- maintaining and documenting liaison with government agencies, as stipulated in permit conditions, as well as responding to any noncompliance issues raised by the agencies;
- participating in ongoing liaison with other stakeholders when warranted;
- preparing daily reports and keeping other records (*e.g.,* photographic record) with regard to project activities;
- tracking environmental issues, including noncompliance issues; and
- preparing the Environmental As-Built Report.

8.3.3 Communication and Reporting

The Environmental Inspectors will report directly to SemCAMS' Construction Supervisor in matters relating to environmental construction and reclamation requirements. Environmental issues and noncompliances, the reasons for the noncompliance, and the measures undertaken for the resolution of

each issue and noncompliance will be recorded and tracked in daily reports. Serious noncompliances will be immediately reported to SemCAMS. If issues remain unresolved following the implementation of remedial measures, the issue and location(s) in question and measures proposed to resolve the issue will be recorded in an Environmental As-Built Report. The Environmental As-Built Report will form the basis of an overall Post-Construction Environmental Report. The Post-Construction Environmental Report will be submitted by SemCAMS to the NEB within six months of the date that the Redwillow Project is put into service, unless otherwise directed by the NEB, and will be the foundation of the PCMP (Section 8.5 of the ESA).

8.3.4 Environmental As-Built Report

Following completion of construction, Environmental Inspectors will assist in the preparation of an Environmental As-Built Report making use of daily reports, photos and records of government liaison. The Environmental As-Built Report will be submitted to SemCAMS and will form the basis of an overall Post-Construction Environmental Report as discussed below.

The Environmental As-Built Report for each spread will contain the following:

- a Project description including what portion of the work was conducted, the construction kick-off and completion dates, and the names of the activity inspectors and other key construction supervisory personnel with whom the Environmental Inspector had regular interactions;
- the general procedures, equipment used and mitigation measures implemented for each activity for which environmental inspection was required;
- the procedures that were implemented in the case of any unforeseen environmental issues that arose, as well as a discussion of the decision making process involved in arriving at those procedures;
- a detailed record of any discussions and decisions made regarding conflicting permit requirements or requests from government agencies;
- a description of problems encountered (*e.g.,* equipment breakdown) that may have been detrimental to the efforts to implement mitigative measures and a discussion of any measures taken to alleviate or counteract those problems;
- a detailed record of any instances where recommendations (*e.g.,* use of a specific type of seeding equipment) could not be implemented and the circumstances and location of the event as well as the decision-making rationale;
- a discussion of specific mitigation techniques and any field adaptations that were used to make the mitigation more effective;
- a record of government and stakeholder liaison;
- a photo record;
- selected Environmental Alignment Sheets with hand-written notes pertinent to the Environmental As-Built Report such as areas where extra temporary workspace was taken, sites where a spot spill occurred, where erosion and/or sediment control measures were installed, location of heritage resources or wildlife or plant species at risk discovered during construction, etc.;
- a list of environmental issues and their respective status (*i.e.,* resolved and unresolved); and
- in the case of unresolved issues, the steps SemCAMS proposes to take to resolve those issues.

Any pertinent paperwork such as memos and permit revisions will appear as an appendix to the Environmental As-Built Report.

8.4 Issue Monitoring During Construction

SemCAMS will strive to carry out the Project in an environmentally responsible manner through the assessment of environmental issues, the planning and implementation of mitigative measures as well as contingency plans to address those issues, and the establishment of compliance initiatives such as environmental education and environmental inspection.

In the event that an unforeseen environmental issue arises during construction for which no mitigative measures have been approved, SemCAMS' Environmental Coordinator and the Environmental Inspector will formulate a plan of action in consultation with the appropriate government agencies. Representatives of the NEB (and others government agencies where appropriate) will be invited to participate. The plan of action will include measures to both assess and mitigate the environmental impact.

No substantial changes to the mitigative measures as they appear in the ESA, EPP, on the Environmental Alignment Sheets or regulatory permits will be made without the approval of the NEB and other appropriate government authorities having jurisdiction.

If the requirements of permits or the direction given by regulators are found to be conflicting, an attempt will be made to resolve the discrepancy or disagreement with available representatives of affected government agencies. The Environmental Inspector will participate in the discussions and record the outcome in the Environmental As-Built Report.

8.5 Post-Construction Monitoring Program

The PCMP will include an assessment of reclamation, revegetation, erosion control and any weed problem areas. Reclamation monitoring involves an assessment of the final clean-up along the right-of-way, which includes: grade restoration; strippings replacement; seeding; drainage restoration; debris removal; trench settlement; and slope stability. Revegetation monitoring involves an assessment of the re-establishment of vegetation and success of revegetation as well as the identification of any weed infestations along the right-of-way. Erosion monitoring involves an assessment of the effect of wind and water along the right-of-way as well as the assessment of effectiveness of any erosion control measures implemented during construction.

SemCAMS will commission PCMPs to be conducted during the first and second complete growing seasons following construction. By initiating these programs in years one and two, issues identified and remedial actions taken during the first year can be assessed and any residual outstanding issues can be dealt with during the next year. Filing of these PCM reports with the NEB enables documentation of the corrective actions and helps tighten overall project timelines. Outstanding right-of-way issues arising after the first two years of construction will be identified through SemCAMS' continuous monitoring of all aspects of right-of-way integrity and addressed as warranted.

The purpose of the PCMP will be to:

- evaluate the recovery of the areas disturbed during pipeline construction;
- assess the status of outstanding environmental issues identified in the Environmental As-Built Report (Section 8.3.4 of the ESA);
- identify any new environmental issues that may have arisen; and
- recommend and coordinate the implementation of any remedial measures that are warranted and additional special measures to address outstanding or new environmental issues.

8.5.1 Reclamation Specialist

Site inspections will be conducted by a qualified reclamation specialist. If necessary, additional expertise will be sought to assess other issues that may arise (*e.g.,* wildlife issues). The appropriate specialists will recommend and oversee the implementation of any remedial measures and conduct follow-up site inspections.

8.5.2 Government Agency Consultation

SemCAMS and/or their representatives will initiate a post-construction dialogue with each applicable government agency (*e.g.*, ASRD, BC MOFR) along the route during the first and second growing seasons after construction to discuss reclamation progress to date and to address and/or resolve any reclamation problems noted by the government agency.

8.5.3 Post-Construction Soils Assessment

During the first growing season after construction, soil sampling will be conducted, if warranted, at sites identified in the Environmental As-Built Report as having issues and where reclamation problems are identified through operation and maintenance reports or aerial and ground reconnaissance. Observations and measurements to assess reclamation success will be collected and documented.

The number of, and distance between, sampling locations along the right-of-way will be determined by the Reclamation Soil Specialist conducting the sampling. It is anticipated that sampling will be more frequent in complex landscapes and less frequent in homogeneous landscapes. Criteria will include, but not be limited to, the following:

- visual indications of potential issues;
- landscape variation;
- changes in construction procedures;
- changes in vegetation species composition; and
- changes in soil moisture.

When issues are identified through this assessment, every effort will be made to implement mitigative measures as soon as feasible following their initial identification. Issues that cannot be mitigated immediately (*e.g.*, subsoil compaction may be identified but soils may be too wet for effective subsoil plowing to be implemented) will be documented in an Environmental Issues Tracking List for mitigation and follow-up monitoring in year two or as soon as conditions allow.

8.5.4 Vegetation Monitoring

The right-of-way will be visually inspected by a reclamation specialist during the first growing season following construction for vegetation issues such as weed infestations or poor vegetation establishment. Timing will be in the late summer/early fall when vegetation is mature enough for accurate identification and evaluation. Particular attention will be given to areas of terrain instability that may be prone to erosion. Detailed vegetation assessments will be conducted, if warranted, at sites where reclamation problems are identified. The above process will be continued during the second year after construction assessment.

8.5.5 Operation and Maintenance Activities

After the first spring and summer following construction, SemCAMS' Operation and Maintenance personnel will monitor the right-of-way as needed to ensure any issues related to trench subsidence, slope or bank erosion or wind and water erosion of soil are identified early and mitigative measures implemented in a timely basis. Following the second year after construction, routine monitoring by SemCAMS personnel will be continuous for the life of the pipeline.

8.5.6 Documentation and Reporting

The PCMP will document, using the Environmental Issues Tracking List, all environmental issues identified for the Project. Issues that have been successfully mitigated will be listed as resolved. The

Environmental Issues Tracking List will also identify any locations with unresolved environmental issues, and the mitigation activities planned by SemCAMS to resolve these issues.

8.5.7 Issue Tracking and Reporting

The status of environmental issues addressed during the PCMP will be tracked through the use of an Environmental Issues Tracking List. This list or database will be updated on an ongoing basis. The Environmental Issues Tracking List will form the basis of a PCM report, which will be prepared at the end of the first-year and second year after construction. Issues that are completely resolved will be removed from the list of the following calendar year.

8.6 Pipeline System Integrity

SemCAMS operates their existing pipeline system in Alberta with great care and diligence. SemCAMS is committed to maintaining their pipeline rights-of-way and operating the pipelines and associated facilities with a continuing high standard of environmental excellence. These high standards of environmental excellence will be executed during the design, construction, operation and decommissioning and abandonment of the Redwillow Pipeline Project.

8.6.1 CAMS Health, Environment and Safety System

SemCAMS is committed to excellence in managing all of the health, environmental and safety aspects of its operation. To achieve this commitment, SemCAMS has developed CHESS. CHESS is comprised of 12 elements including:

- Corporate Commitment;
- Compliance Assurance;
- Health and Safety Management;
- Environmental Management;
- Audits and Inspections;
- Incident Reporting and Investigation;
- Emergency Preparedness and Response;
- Contractor Management;
- Operation Control;
- Communication;
- Employee Training; and
- Policies and Standards.

All SemCAMS employees are responsible for performing their work in a manner consistent with CHESS, as are all temporary employees, consultants and contractors.

Environmental Management

Key goals of the Environmental Management element of CHESS include pollution prevention, energy and resource conservation and waste management. SemCAMS' mission is to continuously reduce the environmental and health impacts of their facilities, operations, products and services. Optimization of SemCAMS' practices and processes will promote the most efficient development, use and conservation or energy resources. SemCAMS' commitment to this effort will lead to the long-term viability of their operation, a competitive advantage and a reputable corporate image in the community.

The objectives of the Environmental Management element of CHESS include:

- demonstrate clear commitment and leadership by management to achieve continuous improvements in the environment;
- maintain a comprehensive inventory of environmental aspects associated with SemCAMS' operational processes. Assure potential environmental risks associated with SemCAMS' operations are identified and ranked as to the impact they could have on the environment;
- conduct assessments of the potential impacts and environmental risks associated with waste and releases within the workplace and the community;
- prioritize waste and releases for a reduction effort (setting objectives, and targets); if appropriate, identify and prioritize products targeted for pollution prevention efforts;
- establish responsibilities and Environmental Management Programs to achieve environmental goals such as reducing waste and releases, flaring, GHGs, etc. Establish action plans for implementation, giving preference first to source reduction, second to recycling / reuse and third to treatment. These techniques may be used separately or in combination with one another;
- measure and evaluate progress in pollution prevention efforts in bi-annual Management Reviews;
- conduct an ongoing dialogue with employees, contractors and the public on all aspects associated with plant operation, impacts and risks of releases, plans for reduction and progress in achieving set goals;
- promote pollution prevention activities with customers, suppliers, contractors and partners, evaluate their performance, and use pollution prevention criteria in determining future business with them;
- maintain a process to evaluate, minimize and/or remediate environmental impacts caused by past operating practices; and
- energy and resource conservation will be achieved through stakeholder awareness, establishment of programs to conduct periodic inventories on energy and fuel usage for all of SemCAMS' assets and ongoing inspections to ensure their processes are efficient.

Within the Environmental Management element of CHESS, there are 17 procedures described that are designed to ensure the environmental goals and objectives described above are met. Where applicable, these 17 procedures as well as the other 11 elements of CHESS will be updated and/or revised to include the construction, operation, decommissioning and abandonment of the Redwillow Pipeline Project.

Further to the elements described in CHESS to meet SemCAMS' environmental goals and objectives, other details regarding petroleum releases, emergencies, etc. are described below and in other sections of the ESA.

The environmental effects associated with petroleum releases include contamination of the air, soil and water (including groundwater) with hydrocarbons. Discussions of the IMPs designed to prevent petroleum releases and the emergency response capabilities in the event that a release does occur are presented in Sections 8.6.2 and 8.7 of the ESA.

Disturbance to the land and watercourses along the right-of-way is the most immediate environmental aspect associated with the Project. Wildlife ranges, fish habitat and forested land could potentially be impacted during construction. More detailed assessments of these potential impacts are provided elsewhere in the ESA, as are mitigation measures to address these concerns (see Section 6.0 of the ESA).

A variety of waste materials, both hazardous and nonhazardous, are generated during pipeline construction, operation and maintenance activities. During construction of the Project, procedures governing the handling, storage and disposal of all waste materials generated will be enforced. Further details on waste management for this Project can be found in Appendix 6C of the ESA.

8.6.2 Pipeline Integrity Management Program

SemCAMS recognizes the high consequence potential of its operations, and has, through its operating history, identified hazards that are considered potential threats to safe and reliable pipeline operation. A combination of management systems, records management systems, condition monitoring, and mitigation programs have been developed in response to hazards presented to their pipelines. These programs form the foundation of integrity management, and are described in the subsections below.

SemCAMS' Pipeline IMP is intended to ensure the long-term functional integrity of its pipeline system, which upholds the previously mentioned commitments as stated in the HES Policy. Furthermore, it provides for compliance with all applicable regulations and pipeline industry standards.

Elements found within SemCAMS' IMP include:

- Documents and records management;
- Training and competency;
- Management of change;
- Hazard identification and risk assessment;
- Options for hazard control and risk reduction;
- Pipeline integrity management planning;
- Inspection, testing, patrols and monitoring; and
- Pipeline IMP review and evaluation.

Documents and Record Management

The objective of SemCAMS' Documents and Record Management program is to identify and ensure critical or mandatory documentation is managed effectively. Pipeline IMP records are kept for the following activities:

- design and construction – generally provide original and current design information and records pertaining to inspections and tests performed;
- maintenance, repair and alteration – records document both direct and indirect maintenance activities and changes performed to the pipeline after initial operation up to and including decommissioning of the pipeline;
- operating – records provide information for the safe and reliable operation of the pipeline including operating procedures and conditions and any changes to either. Cathodic protection, pigging, routine monitoring, etc. also require records of a non-detailed but continuous nature, such as a log; and

- corrosion integrity management and inspection – records are those directly related to the integrity management, corrosion monitoring and assessment, inspection and includes failure analysis records and evaluations of the pipeline pressure envelope.

Retention of the following records is required for existing pipelines and as part of any new pipeline construction:

- the locations of the pipeline with respect to crossings and nearby land developments;
- Class locations;
- the design of the pipeline, including limits on pressure, temperature, loading and other operating conditions;
- the standards and specifications for the pipe, components, bolting, and coating materials;
- material test reports;
- joining and inspection records;
- coating and inspection records;
- terrain, soil type, backfill material and depth of cover;
- pressure testing;
- cathodic protection system design and performances;
- the methods used and the results obtained for the activities included in the pipeline IMP;
- QA/QC packages;
- purchase orders and associated information;
- welding maps/join maps; and
- pipeline risk assessment.

Training and Competency

SemCAMS' management ensures systems are in place to manage competency and training requirements for company personnel, contractors and consultants. The system must ensure appropriate knowledge and skills are conveyed and verified for performance of tasks that may affect pipeline integrity.

SemCAMS' management will ensure that new technologies, industry best practices and regulatory requirements are evaluated, considered and incorporated as appropriate. As such, where critical new processes, procedures or practices are introduced or new or different equipment is installed, SemCAMS' management will ensure that adequate training is provided and competency verified prior to implementation of task or operation of the equipment.

Management of Change

SemCAMS maintains a corporate Management of Change (MOC) procedure to ensure compliance of all changes to regulatory requirements and as close as possible to Best Industry and Engineering Practice. SemCAMS' MOC is designed after CSA Z662-03 Annex N, Clause N.8 that requires all pipeline operating companies develop and implement a change management process for changes that affect the integrity of their pipelines or their ability to manage pipeline integrity.

Hazard Identification and Risk Assessment

CSA Z662, Annex B is the basis of SemCAMS' process for hazard identification and risk assessment, thus ensuring compliance and alignment with industry best practice. SemCAMS maintains a database called the Pipeline Integrity Data Management System (PIDMS). The PIDMS contains information pertaining to all pipelines and pipeline segments owned and or operated by SemCAMS. Information from the PIDMS is used to identify all pipelines and gather operating and static information that may directly or indirectly be a hazard, or pose an integrity risk. Basic risk ranking can be performed using these data.

Where hazards that might lead to a failure or external interference incident with the considerable consequences are identified, SemCAMS will:

- asses the risks associated with the identified hazards; and
- communicate the hazard to pipeline operations for identification measures for monitoring conditions that could lead to failure or external interference incident and eliminate or mitigate such conditions.

Risks deemed to be significant will be evaluated for risk reduction, using options identified in CSA Z662 Annex N, Section N.12 as a guide.

Pipeline Integrity Management Planning

Pipeline Integrity Management plans are generated to consolidate and document activities designed to ensure the continued integrity and safe, reliable operation of SemCAMS' pipelines. To a large extent, these activities define the strategy to mitigate hazards or potential hazards identified through the Hazard Analysis. SemCAMS has a system in place to ensure required activities are effectively planned, scheduled and executed.

For routine activities (*e.g.*, brushing, signage, patrols, etc.) a matrix is maintained and periodically verified outlining all required routine activities. This matrix is based on industry and regulatory standards and is used as an essential tool for periodic verification that required activities are being scheduled and performed.

For non-routine and critical integrity management activities that may directly affect the pipeline's ability to contain product (*e.g.*, chemical programs, pigging programs, leak detection, etc.), a Pipeline IMP is developed to detail the requirements. This includes defining the schedule and degree to which certain activities are performed and verified.

All Pipeline IMPs are reviewed annually to ensure they meet applicable requirements, and to ensure that the plan is still valid. Verification of each plan will also confirm with operations that operating conditions of a particular pipeline have not changed over the past year.

Inspection, Testing, Patrols and Monitoring

SemCAMS will ensure inspection, testing, patrol and monitoring requirements are well defined and that all supporting procedures and guidelines meet applicable requirements. SemCAMS' Inspection, testing, patrol and monitoring requirements including scope, frequency, methods, records, etc. are based on industry and regulatory standards (*e.g.,* CSA Z662 and EUB Directive 066 [2005]). SemCAMS' management will ensure that all procedures and guidelines are available to personnel performing the work and that all personnel assigned are adequately trained, certified and competent to perform the work.

Records of all inspection, testing, patrols and monitoring activities will be kept. Appropriate SemCAMS' supervisory staff will review these records and monitor work under their area of responsibility and control. Where the results of inspection, testing, patrols and monitoring activities indicate an unmanaged change, reveal a new or potential hazard, SemCAMS will generate an Exception Report of the anomaly. A log of exceptions will be maintained indicating date initiated, work ordered, description and date closed.

SemCAMS will maintain a matrix of preferred mitigation and repair options to address anticipated conditions or defects that could cause a failure incident with significant consequences. Where repairs and

alterations are considered, good materials, engineering and construction / installation practices will be followed and will meet the requirements of CSA Z662 for the installation and maintenance of pipelines. All work will be performed by qualified and competent SemCAMS' staff or contractors.

Pipeline IMP Review and Evaluation

SemCAMS will review the Pipeline IMP annually and/or whenever events or changes are made to codes, Acts or regulations governing SemCAMS' pipelines. Changes and adjustments to the program will also be considered when:

- there are changes to the company, SemCAMS' pipelines or external factors;
- the findings, status and trends of corrective actions identified in internal or external audits becomes available;
- the status or trends of integrity performance indicators related to the frequency and consequences of external interference incidents and failure incidents and the completion of integrity-related work is understood;
- the status and trends of integrity related issues and recommendations identified during previous reviews and evaluations, operations, maintenance or integrity-related work is known;
- the root cause of recent incidents is understood;
- the success of problems experienced in detecting and preventing potential failure incidents is documented.

Internal audits of the IMP will be conducted every two years by SemCAMS. External audits of the Pipeline IMP will be conducted every four years. Audit scope and objectives will evaluate all corporate departments for roles and responsibilities compliance with the Pipeline IMP. A Randomly selected sample of SemCAMS-owned and/or operated pipelines will be generated for each audit. SemCAMS' management will ensure that all audits are performed by staff or contractors that are independent of the corporate policies and procedures being audited. Auditors must have prior experience with Pipeline IMPs and be familiar with program requirements and must span all corporate disciplines.

8.7 Emergency Response Plan

SemCAMS has existing ERPs in place for their existing operations. These plans are based on Alberta provincial requirements (*i.e.*, EUB). The purpose of an ERP is to protect the safety of the public, SemCAMS personnel and provide for greater protection of the environment. The ERP contains the criteria for assessing potential emergency situation and outlines the responsibilities and action plans of company personnel to inform the affected stakeholders (area residents and the public, as well as regulatory, local and provincial government authorities) to resolve an emergency situation effectively and efficiently. The expectation is to have a quick response to any incident so that there is no significant effect on staff, the public, property or livestock in the area.

SemCAMS will create a new ERP for the Redwillow Pipeline Project. The new ERP will be filed with applicable regulators prior to the commencement of pipeline operations.

The ERP that will be created for the Redwillow Pipeline will include the following:

- A telephone directory complete with an Emergency Notification Flow Chart;
- Area and facility information including pipelines and control systems (*e.g.*, ESD valves); and
- EPZ information.

Additional information for each of these components of the ERP is provided in the following sections.

8.7.1 Telephone Directory

The ERP will contain a telephone directory that will include contact information for:

- both SemCAMS head office and regional pipeline and facility operations staff;
- applicable provincial regulatory agencies (*e.g.,* the EUB Grande Prairie Field Centre);
- the NEB;
- industry support service providers (*e.g.*, air monitoring, safety companies, general contractors, etc.);
- applicable municipal representatives; and
- emergency services providers (*e.g.*, police, fire, hospitals, etc.).

The telephone directory contained within the ERP will also contain an Emergency Notification Flow Chart that details the order in which notifications are to be made in the event of an emergency. This chart will contain contact information for SemCAMS personnel, provincial government and municipal contacts as well as emergency and industrial service providers.

There is more detailed contact information contained within the Emergency Notification Flow Chart including applicable contacts for communities in the vicinity of the project area, various branches of provincial government that need to be aware of emergency situations (*e.g.*, AIT should there be a need to close a provincial highway and reroute traffic onto alternate routes).

8.7.2 Area and Facility Information

The ERP will describe the general environmental and social setting of the project area including land ownership, municipalities traversed by the pipeline and current industrial and recreational activities that are undertaken in the vicinity of the pipeline and associated facilities. Area maps will be provided in the ERP that illustrate the route and its proximity to communities, roads, and other public places such as campgrounds and parks.

The ERP will also briefly describe the specifications of the pipeline system including pipeline diameter, length, source and delivery points and their legal locations. The location of the ESD valves, as well as information regarding maximum operating pressure, volume of gas between ESD valves, sour content of this overall volume of gas and other pertinent information that needs to be known in an emergency situation will be tabled in this section of the ERP.

ESD valves are designed to isolate the pipeline system in case of a failure or emergency by minimizing the volume of gas that could be released. The ESD valves will be designed to close instantaneously following a catastrophic rupture, limiting the volume of gas released to the pipeline segment between the ESD valves. The ESD valves will also be designed to be remotely closed from the Pipeline Control Centre located in Edson, Alberta.

8.7.3 Emergency Planning Zone Information

The ERP covers an area surrounding the pipeline and associated facilities, known as the EPZ, which could become hazardous if a hydrocarbon spill or a sour gas release were to occur. In order to protect the safety of the public located near its operations, SemCAMS will establish an EPZ surrounding the Redwillow Pipeline System in accordance with the EUB EPZ Model Version 1.09 (2006), which considers paramaters such the maximum volume of H_2S that could be released from the pipeline assuming the line is filled with natural gas and is at maximum operating pressure and maximum H_2S concentration. The size of the EPZ for this project is approximately 14 km on either side of the pipleline in populated areas and approximately 30 km on either side of the pipeline in nonpopulated regions.

Public Awareness

During preparation of the ERP, SemCAMS will identify and consult with the area stakeholders including residents, trappers, industry operators, and local authorities within or immediately adjacent to the established EPZs to:

- present information about the ERP as well as provide the stakeholders with the opportunity to contribute to the ERP;
- acquire pertinent information for emergency planning; and
- discuss any questions and/or concerns stakeholders may have.

The ERP will provide contact information for all stakeholders that live and/or work or otherwise conduct business within the EPZ. The ERP will also detail information regarding reception centres (*i.e.*, muster points) for residents, trappers, workers, and anyone else that might be evacuated in an emergency situation. SemCAMS' reviews their ERPs annually in accordance with EUB standards for content and format to ensure that the plans meet or exceed the expectation laid out in EUB Directive 071 (EUB 2003).

8.8 Follow-Up

The *Canadian Environmental Assessment (CEA) Act* defines follow-up as:

> *"a program for verifying the accuracy of the environmental assessment of a project, and determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project."*

The Operational Policy Statement Follow-up under the *CEA Act* provides the following reasons as to why a follow-up program should be considered in an ESA:

- to facilitate better overall project management by considering follow-up program framework at the earliest stages of project planning;
- to provide information on environmental effects and mitigation resulting from project implementation that can be used to improve and/or support future ESAs including cumulative effects assessment;
- to aid in the detection of unanticipated environmental effects; and
- to support or verify predictions made concerning the likelihood of "no significant environmental effects".

The NEB *Filing Manual* (2004) acknowledges that monitoring is an integral part of the follow-up program. However, CEA Agency notes that compliance monitoring, which verifies the proper implementation of all mitigation measures, on its own does not satisfy the requirements of a follow-up program. To that end, in addition to the Project-specific EPP (Appendix 6A of the ESA), environmental inspection and preparation of an Environmental As-Built Report (Section 8.3 of the ESA) to be undertaken as part of compliance monitoring, SemCAMS will conduct a PCMP over a two-year period as described in Section 8.5 of the ESA. This program will be one method in determining the effectiveness of measures taken to mitigate the adverse environmental effects of the Project and is a requirement of the NEB *Filing Manual* (2004).

Analysis and reporting of the results of the PCMP will be in accordance with Guide AA.2 of the NEB *Filing Manual* (2004). Similarly, the reporting of the results of the follow-up program will include a determination of the following:

- whether any post-construction remedial actions were necessary;
- whether the results of the follow-up program were in accordance with the predicted effects; and
- whether any lessons were learned.

8.9 References

8.9.1 Literature Cited

Alberta Energy and Utilities Board. 2003. Emergency Preparedness and Response Requirements for the Upstream Petroleum Industry. 47 pp. Website: http://www.eub.ca/docs/documents/directives/Directive071.pdf.

Alberta Energy and Utilities Board. 2005. Directive 66: Requirements and Procedures for Pipelines. Website: http://www.eub.ca/docs/documents/directives/directive066.pdf.

Alberta Energy and Utilities Board. 2006. EUBH2S: A Model for Calculating Emergency Response and Planning Zones for Sour Gas Facilities. Version 1.09, Public Safety and Air Quality Management, Calgary, Alberta.

National Energy Board. 2004 and revisions. National Energy Board Filing Manual. Website: http://www.neb-one.gc.ca/clf-nsi/rpblctn/ctsndrgltn/flngmnl/fmflngmnl-eng.pdf.