

2019/20

Orphan Site Reclamation Fund Annual Report

BC Oil and Gas Commission

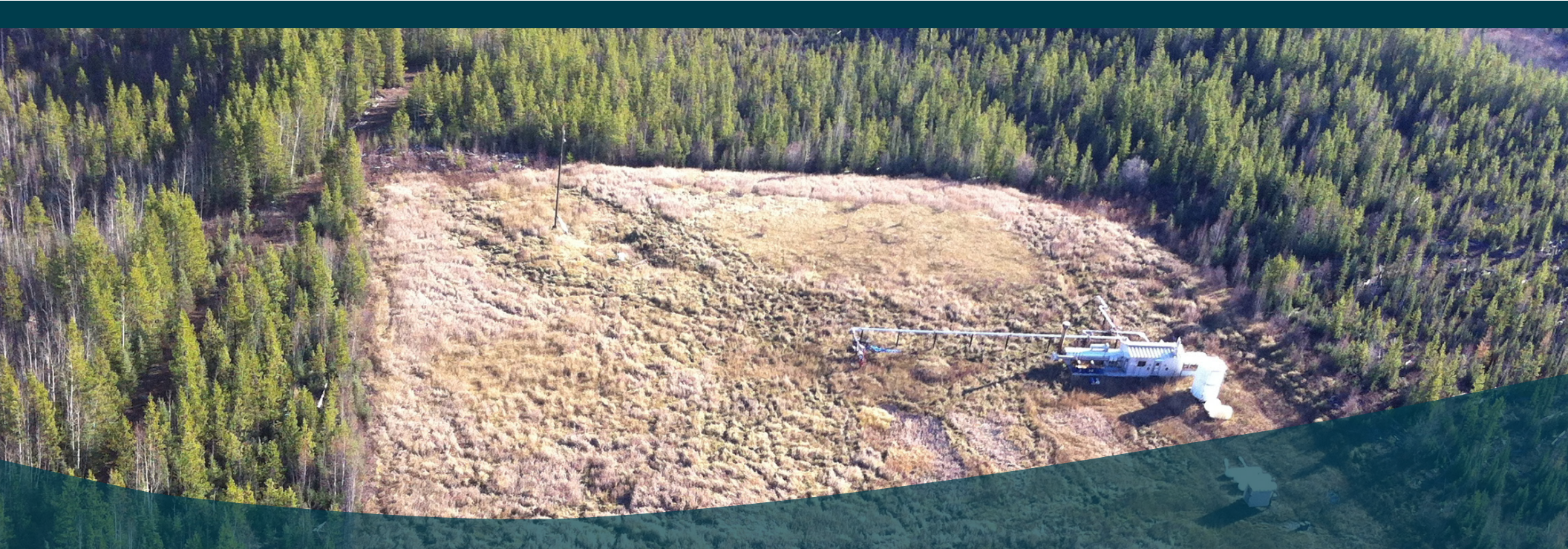


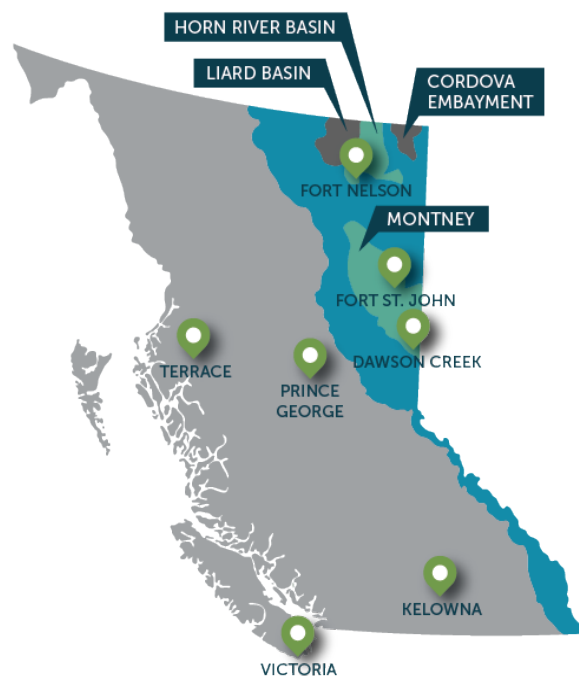
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About the BC Oil and Gas Commission

The BC Oil and Gas Commission (Commission) is the provincial regulatory agency with responsibilities for regulating oil and gas activities in British Columbia, including exploration, development, pipeline transportation and reclamation.

The Commission's core services include reviewing and assessing applications for industry activity, consulting with First Nations, cooperating with partner agencies, and ensuring industry complies with provincial legislation and all regulatory requirements. The public interest is protected by ensuring public safety, respecting those affected by oil and gas activities, conserving the environment, and ensuring equitable participation in production.



Vision

Safe and responsible energy resource development for British Columbia.

Mission

We provide British Columbia with regulatory excellence in responsible energy resource development by:

- Protecting public safety,
- Safeguarding the environment, and
- Respecting those who are affected.

Values

Transparency is our commitment to be open and provide clear information on decisions, operations and actions.

Innovation is our commitment to learn, adapt, act and grow.

Integrity is our commitment to the principles of fairness, trust and accountability.

Respect is our commitment to listen, accept and value diverse perspectives.

Responsiveness is our commitment to listening and timely and meaningful action.

Cover image photo (previous page):

Oil and gas site prior to decommissioning.

Orphan Site Reclamation Fund Overview

In British Columbia, oil and gas sites such as wells, facilities, pipelines and/or sites affected by oil and gas activities where the operator is insolvent or cannot be located, may be designated as orphan sites by the Commission.

Once a site has been designated an orphan, the Commission may use the Orphan Site Reclamation Fund (OSRF) to decommission and restore the site. The closure process provides assurance to stakeholders that the site has been restored in accordance with current standards and requirements, and all known contamination risks or other hazards have been mitigated.

The Commission's primary goal is to protect public safety and the environment, and work on orphan sites must first address these risks. Once site risks are assessed and mitigated, closure work considers planning for area-based efficiencies, the interests of impacted private land owners, the interests of impacted Indigenous communities, and stewardship goals (restoration of soils, plants and wildlife habitat).

The closure process for orphan sites is a multi-year process where some phases may take place concurrently, and in other instances, one or more phases must be complete before another phase can begin. A site that requires all work phases to be completed may take more time than a site that only requires surface reclamation (e.g. no equipment or contamination to address). The completion of certain phases must be coordinated, and sites will require continuous review and reprioritization.

For more information on the OSRF, and for a current list of orphan sites, please visit:

bcogc.ca/what-we-regulate/oil-gas/orphan-sites

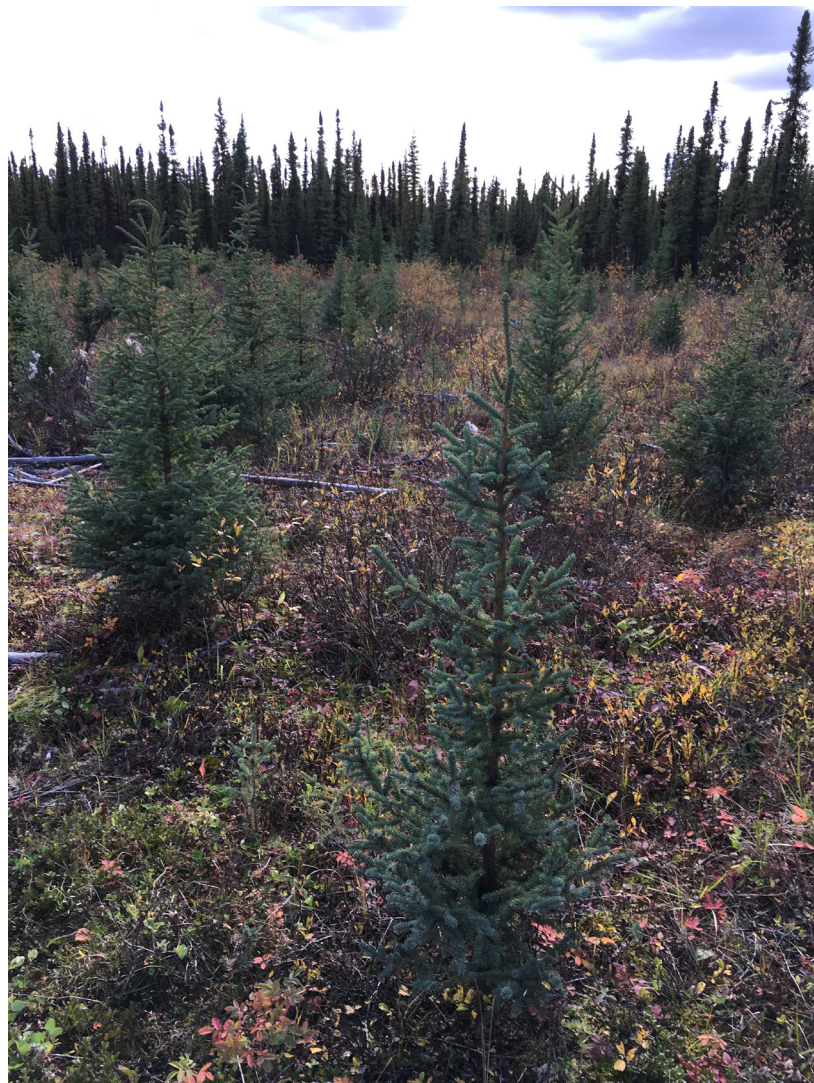


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Regrowth on a reclaimed site.

Industry Funding for Orphan Site Restoration

The Commission's Comprehensive Liability Management Plan has been designed to ensure the cost to restore oil and gas sites in B.C. continues to be paid for by industry. This plan includes the introduction of an Orphan Levy, which replaces the former Orphan Tax. The new levy requires industry to fund \$15 million per year in orphan restoration work.

For more information on the Comprehensive Liability Management Plan, please visit the Commission's [website](#).



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Decommissioned site
prior to reclamation.

The Restoration Process

1. Site Deactivation: The Commission's primary goal is to protect public safety and the environment, and work on orphan sites must first address these risks. The first step in achieving this is to ensure all wells, facilities, and pipelines are shut in, storage tanks are drained, and pipelines and facility piping is purged and depressurized.

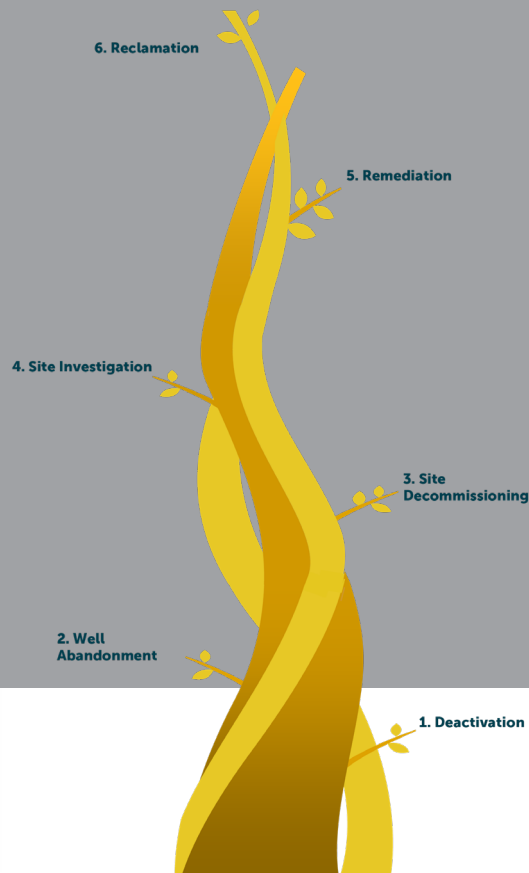
2. Well Abandonment: Orphan sites not properly decommissioned require plugging (downhole abandonment) and cut and cap activities (surface abandonment), as part of the closure process. Well abandonment activities include the permanent plugging of the producing zone(s), and isolating porous formations within a well. This prevents production fluid and gases from travelling up the wellbore to the surface or between formations.

3. Site Decommissioning: Orphan sites with permitted surface and subsurface facilities require the safe removal and disposal of associated operating equipment prior to completing any intrusive soil and/or groundwater quality assessments. Decommissioning activities also include the removal of all facility flow lines, piles, concrete and debris that may also be on a site. Deactivated pipelines are removed to the site's boundary or to a depth suitable to not impede land use, and are cut and capped below grade.

4. Investigation: During this phase, the site undergoes intrusive soil and/or groundwater sampling to confirm if the soil, surface and groundwater quality meets the standards for final land use, or the site does not pose a significant risk to human health or the environment. Investigation at each site is subject to areas of potential environmental concern identified during a historical file review. Results of the investigation determine if the site is suitable for closure or if remediation is required.

5. Remediation: If a site investigation identified contamination, then remediation is required prior to moving onto reclamation. Remediation may include the removal and transport of contaminated soil to a licensed facility for disposal, or treatment of the soil to reduce contaminants to concentrations less than the applicable provincial standards. Investigation and remediation activities must be overseen by a practicing professional.

6. Reclamation: In the final phase of site restoration, a site is reclaimed to meet appropriate land use productivity standards. Surface reclamation commonly includes surface contouring, topsoil replacement, revegetation, and monitoring to return the site to acceptable pre-disturbance conditions.



Our Orphan Restoration Goals

It is the Commission's mission to protect public safety and the environment. To meet this mission, we plan to deactivate pipelines and abandon high priority wells within one year of orphan designation. This ensures orphan infrastructure is left in a safe state, providing the Commission with the flexibility to plan large area-based decommissioning and restoration programs to maximize efficiencies and rates of closure.

Barring any unforeseen increases in the orphan population, the execution of these large programs will allow us to complete restoration work on orphan sites within 10 years of their designation. Monitoring and maintenance may continue to be completed prior to final closure.



Respecting Those Affected by Orphan Sites

In the course of developing natural resources below the land, an operator may become insolvent. In these cases, site maintenance, safety and restoration become the Commission's priority. Land owners are not responsible for managing or maintaining orphan sites. Land owners can apply for compensation for outstanding rental payments in relation to the surface lease of an orphan site when the Commission commits to expending funds to restore an orphan site.

Through the 2019/20 fiscal year, the Commission paid \$434,000 in compensation to affected land owners for missed rental payments.

The Commission is also partnering with Indigenous communities on orphan site restoration. The overall objective of these partnerships is to support First Nations' interests to share knowledge of restoration successes as well as areas for improvement, and provide opportunities for direct community member participation/employment in the restoration process. Pilot projects have been launched with several Treaty 8 communities to implement restoration pilots. In addition, the Commission is also working with multiple Indigenous service providers to carry out decommissioning and restoration programs.

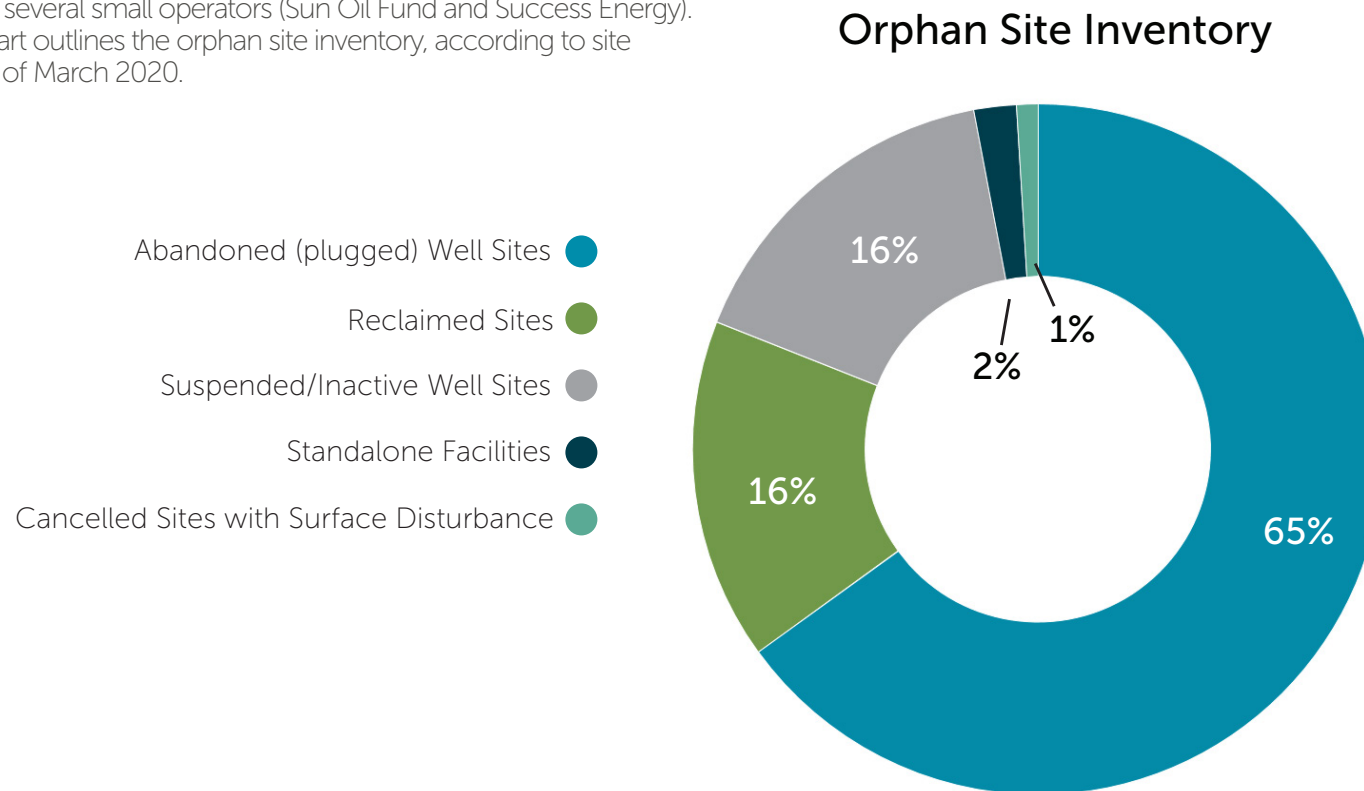


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Oil and gas sites like this one are designated orphans if the operator is insolvent or cannot be located.

Orphan Site Reclamation Fund Summary

At the end of the 2019/20 fiscal year, there were 357 orphan sites (including well and standalone facility sites). The increase in orphans (11) was due to the insolvency of several small operators (Sun Oil Fund and Success Energy). The following chart outlines the orphan site inventory, according to site status, at the end of March 2020.



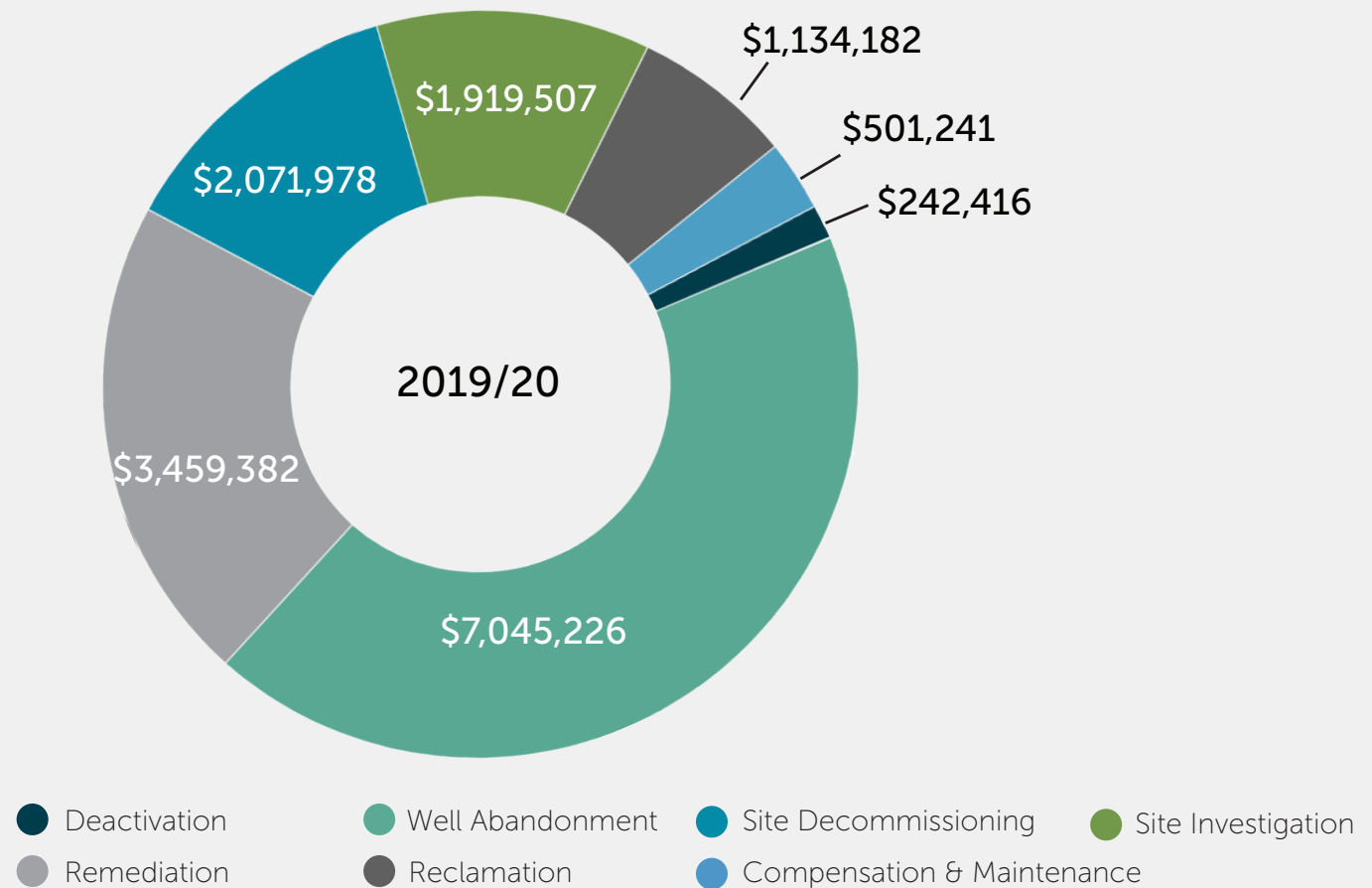
Following the close of the 2019/20 fiscal year, in June 2020, an additional 413 sites were designated as orphans, largely due to the conclusion of the Ranch Energy proceedings and insolvency of Predator Oil BC Ltd (404 sites), as well as the insolvency of Norcan Energy (nine sites). Activities on these sites will be reported in the 2020/21 OSRF Annual Report.

The focus of the 2019/20 work plan was to complete work prioritized for the protection of public safety and the environment, but also to incorporate surrounding orphan infrastructure into large, area-based programs. This involved the continuation of efforts to abandon (permanently plug) wells and remove equipment and infrastructure, allowing increased efforts on reclamation activities in the coming years.

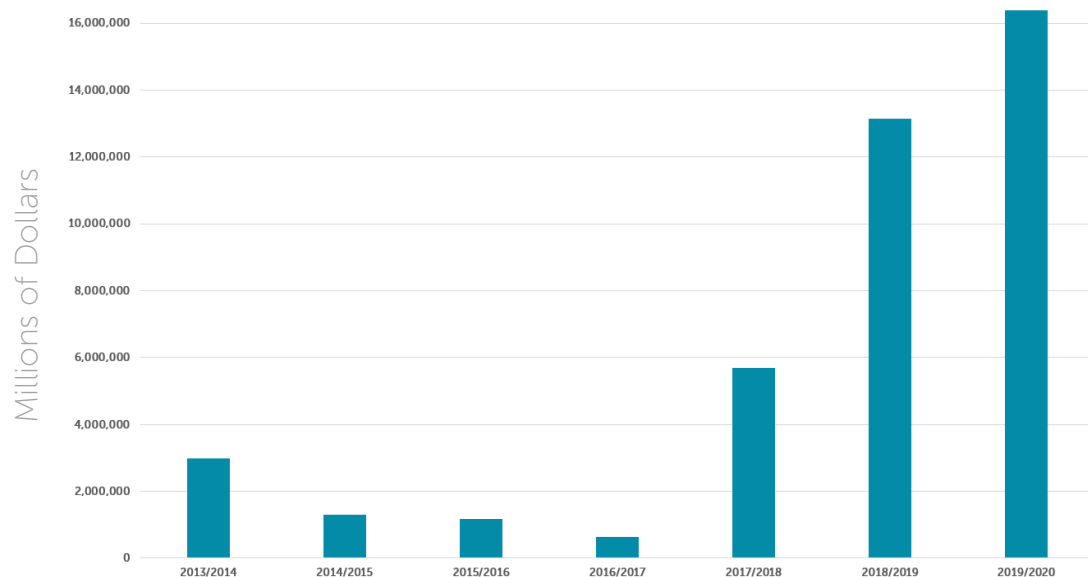
Orphan Site Reclamation Fund Spending Breakdown

Work on orphan sites is completed under five main work streams, the four closure phases detailed above, and Site Administration, which includes Site Maintenance, Land Owner Compensation, and General/Administrative Expenditures. Total spending in the fiscal year reached \$16.4 million, which has been broken down into costs associated with each work stream below:

Fiscal Year OSRF Program Spends



Total OSRF Expenditures by Fiscal Year



Site Deactivation

During 2019/20, 16 inactive pipeline segments and associated sites, largely located east of Fort Nelson in the Yoyo field, were deactivated and safe-stated.

On average, the deactivation of a pipeline and associated site costs approximately \$15,000; however, costs will vary depending on location, size, and volume of fluid.

Well Abandonment

During the fiscal year, 76 wells were downhole abandoned. Of these wells, most were located within the Peace River region near Fort St. John, and a portion were located in the Ladyfern field (more than 100 km northeast of Fort St. John). Efficiencies were accomplished by targeting all wells requiring abandonment within the same field. Costs are overall reduced in the abandonment programs due to their larger scale, where resources and equipment can be shared amongst multiple rigs and crews.

Generally speaking, standard abandonment costs for wells in the Peace River program were higher than those in the Ladyfern program, as the latter were very simple and routine operations. In addition, wells requiring remedial cementing involve more extensive logging and cementing work, creating additional time and resulting cost per well. A select number of these wells were also more remote and required winter access, further increasing costs per well. Average costs per well are outlined for different categories in the table to the right.

There has been a substantial increase to the number of well abandonments completed each year to address the increase in the orphan population. The number of orphan wells awaiting abandonment has consistently decreased over the last three years, and at the end of March 2020, only 56 orphan wells were awaiting abandonment.

2019/20 Average Costs Per Well

Abandonment Category	Number of Wells	Average Cost Per Well
All Well Abandonments	76	\$103,968
Peace River Standard Abandonments	30	\$67,022
Ladyfern Standard Abandonments	25	\$23,246
Abandonment & Remedial Cementing	21	\$252,847

Site Decommissioning

The 2019/20 fiscal year saw a large site decommissioning program to continue efforts to remove infrastructure that has been orphaned in recent years. In addition, the larger program provided increased efficiencies by completing the well and pipeline abandonments and site decommissioning concurrently. A total of 64 equipment sites were decommissioned in two programs. The largest of the programs was in the Peace River area north of Fort St. John (Buick and Stoddart fields). The second program was in the Ladyfern.

Costs for site decommissioning can vary greatly and is largely dependent on the amount of equipment onsite. Expenditures by site ranged from less than \$1,000 for removal of a pipeline riser, to approximately \$180,000 for decommissioning and removal of a large compressor/dehydrator station. The average cost to decommission a site in the fiscal year was \$32,000.

Site Investigation

The completion of site investigations allows for the planning of any necessary remediation activities, or determining whether the site is suitable to proceed to reclamation. In most scenarios, remediation activities are not required after the site investigation confirms acceptable environmental quality. During fiscal 2019/20, site investigations were fully completed on 85 orphan sites at an average cost of \$16,900 per site. More limited investigations were completed at an additional 45 sites, which involved sample collection during various activities (e.g. sampling during cutting and capping the wellhead after abandonment).

The Ladyfern Program

The Ladyfern field is located more than 100 km northeast of Fort St. John and most sites are accessed by way of winter ice roads. In order to maximize efficiencies and take advantage of established winter access, the complete restoration process was programmed for a cluster of orphan sites within the area. The Ladyfern program included abandonment, equipment decommissioning, site investigation, and reclamation work through the coordination of multiple crews and subject matter experts. The full program was completed during winter 2020, allowing revegetation efforts in the following spring.



Photo above:

Replacing and mounding surface soils to mimic terrain and prepare for planting.

Remediation

In select cases, remediation of soil or groundwater is required before reclamation activities may be completed. Remediation activities were completed on 15 sites. These sites were largely located near Fort St. John, while a few sites were located in more remote, winter access areas northeast of Fort Nelson. Costs for these activities will vary greatly and depend on the complexity and extent of impacts. Overall, remediation expenditures averaged at \$229,000 for the 15 sites.

Reclamation

Where environmental quality indicates the site is suitable, reclamation activities can be conducted to complete the restoration process and make the site suitable for return to the land owner or the public. Reclamation work may include the replacement of salvaged soil and the seeding of a land owner-approved mix (private land), or revegetation with species suitable for the land use and ecology (Crown land). Once the site is reclaimed, monitoring is required to ensure reclamation success and the absence of noxious weeds. Overall, these activities were conducted (all or in part) on 56 sites during the fiscal year; the reclamation process was substantially completed on 31 sites, and excluding sites where only minor work was completed, the average cost was \$33,000 per site.

Summary

The end of the 2019/20 fiscal year saw the designation of 11 orphan sites, bringing the total number of sites to 357. Throughout recent years, the Commission was successful in addressing high-priority well abandonments and completing required deactivations within 12 months of designation. Significant efforts in well abandonment and decommissioning over the last couple years have resulted in almost 85 per cent of sites having no further infrastructure remaining.

Due to the increase in the number of orphan sites, the rate of abandonment and decommissioning has continued to increase through the fiscal year. The work plan focused on large-scale well abandonment and site decommissioning programs. A large site investigation program was completed, which will form additional remediation and reclamation activities next year. Remediation and reclamation efforts increased significantly from previous work plans, which will continue through the coming years.

Outreach and engagement efforts will continue with impacted land owners and Indigenous communities, and further efforts will be made to work collaboratively and streamline restoration work. At the end of March 31, 2020, a total of 56 orphan sites have been restored. As significant progress has been made on abandonment and decommissioning work, additional efforts can shift to increase the number of sites receiving reclamation work in the next few years.





More Information

bcogc.ca

This report was published in March 2021 and is updated annually.

For specific questions or enquiries regarding this document or the Orphan Site Reclamation Fund, please contact:

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