

Oil and Gas

This case study shows the application of key legislative requirements for qualifying R&D activities as they apply to relevant activities in the oil and gas industry.

Business Scenario

Burrow Geoscience Solutions (BGS) is an innovative geoscience company offering a diverse range of products and services to the global oil and gas industry. In particular, BGS has developed a new range of software that assists clients in the exploration process by utilizing seismic data processing, imaging and interpretation.

Since BGS's inception in 2003, the firm has matured with research and development (R&D) underlining the core of the company's business activities. BGS's projects began with the main objective to develop a processing and imaging toolkit for small-scaling processing. The team soon realised that the interpretation software tools existing on the market were inconvenient and out-dated; this ultimately led to BGS's creation of a unique suite of cutting-edge software.

BGS constantly conducted R&D over the years to create new and improved products to perform to the best of its ability. In the past few years, BGS has augmented to include illumination studies, petrophysics, seismic data processing, depth imaging, geostatistical depth conversion, quantitative interpretation and multi-client studies. Currently, BGS's services span the entire exploration and production lifecycle.

In order to qualify for the Research and Development Tax Credit, BGS needed to determine the eligibility of its proposed R&D activities. The "qualified research" must meet four main criteria, known and developed by Congress as the Four-Part Test. BGS's qualified R&D activities included the following.

BGS's Eligible R&D Activities:

Design and development of a series of prototypes to achieve the technical objectives (design of an interpretation software).

BGS's hypothesis for this activity questioned whether a software could be designed and developed to assist in the exploration process.

The experiments BGS conducted in the design phase predominantly entailed computer modelling, conceptual engineering drawings and mathematical calculations. These experiments could only be proven effective or ineffective in the prototype development and testing phase. Following the experiments in that phase, during which the product was built and tested in various applications, the design was modified and re-tested until the desired outcome was achieved.

Trials and analysis of data to achieve results that can be reproduced to a satisfactory standard (development and testing of software).

The main objective for this activity stated that with improved knowledge of the intrinsic factors related to the extraction of oil and gas, it was possible to identify mechanisms for improving for the seismic data processing, imaging and interpretation.

Details of this experiment included development of the enhancers based on information gained through the model and testing of the enhancers to ensure efficiency, accuracy and safety.

Background research to evaluate current knowledge gaps and determine feasibility (background research of the development of BGS's products).

Prior to 2003, the interpretation software tools existing on the market were cumbersome and obsolete. Thus, besides the lack of comparable solutions available, the outcomes of activities in this research could not have been known or determined in advance due to a number of specific technical challenges.

BGS's eligible R&D activities during this phase of experimentation included:

- Literature search and review, including maintaining up-to-date knowledge on relevant certification and standards.
- Consultation with industry professionals and potential customers to determine the level of interest and commercial feasibility of the product.
- Preliminary equipment and resources review with respect to capacity, performance and suitability for the project.
- Consultation with key component/part/assembly suppliers to determine the factors they considered important in the design and to gain an understanding of how the design needed to be structured accordingly.

The background research conducted by BGS was directly related to the main objective of designing interpretation software, therefore qualifying as R&D.

Ongoing analysis of customer or user feedback to improve the prototype design (feedback R&D of the interpretation software).

BGS's eligible R&D activity for this phase of its project included:

- Ongoing analysis and testing to improve the efficiency and safety of the project.
- Ongoing development and modification to interpret the experimental results and draw conclusions that served as starting points for the development of new hypotheses.
- Commercial analysis and functionality review.

These activities were necessary to evaluate the performance capabilities of the new design in the field and to improve any flaws in the design, therefore qualifying as R&D.

Commentary

Qualified Research Defined

Qualified research consists of research for the intent of developing new or improved business components. A business component is defined as any product, process, technique, invention, formula, or computer software that the taxpayer intends to hold for sale, lease, license, or actual use in the taxpayer's trade or business.

The Four-Part Test

Activities that are eligible for the R&D Credit are described in the "Four-Part Test" which must be met for the activity to qualify as R&D.

1. **Permitted Purpose:** The purpose of the activity or project must be to create new (or improve existing) functionality, performance, reliability, or quality of a business component.

2. **Elimination of Uncertainty:** The taxpayer must intend to discover information that would eliminate uncertainty concerning the development or improvement of the business component. Uncertainty exists if the information available to the taxpayer does not establish the capability of development or improvement, method of development or improvement, or the appropriateness of the business component's design.

3. **Process of Experimentation:** The taxpayer must undergo a systematic process designed to evaluate one or more alternatives to achieve a result where the capability or the method of achieving that result, or the appropriate design of that result, is uncertain at the beginning of the taxpayer's research activities.

4. **Technological in Nature:** The process of experimentation used to discover information must fundamentally rely on principles of hard science such as physical or biological sciences, chemistry, engineering or computer science.

What records and specific documentation did BGS keep?

Similar to any tax credit or deduction, BGS had to save business records that outlined what it did in its R&D activities, including experimental activities and documents to prove that the work took place in a systematic manner. BGS saved the following documentation:

- Project records/ lab notes
- Innovation Log
- Conceptual sketches
- Design drawings
- Literature review
- Background research
- Records of changes and bug fixes
- Testing protocols
- Results of records of analysis from testing/trial runs
- Records of resource allocation/usage logs
- Staff time sheets
- Tax invoices
- Receipts
- Patent application number

By having these records on file, BGS confirmed that it was "compliance ready" — meaning if it was audited by the IRS, it could present documentation to show the progression of its R&D work, ultimately proving its R&D eligibility.