

Case Study: In-Situ Hydrocarbon Remediation at Baker Hughes INTEQ

Location: Casper, Wyoming

Background:

Baker Hughes INTEQ, a global leader in oilfield services, faced a significant **hydrocarbon contamination** issue at their **Oil Tool Division facility in Casper, Wyoming**. The contamination, stemming from prolonged industrial activities, had affected the **warehouse, tooling shop, staging yard, and parking lot**, resulting in **strong hydrocarbon odors** and regulatory concerns.

A third-party coring company was commissioned to drill **test wells**, revealing contamination extending to **22 feet below the surface**. Field testing conducted by **X4 Environmental Inc.** confirmed that **Total Petroleum Hydrocarbon (TPH) levels ranged from 3.4% at the surface to 2.8% at 22 feet (28,000–34,000 ppm)**, far exceeding the **Wyoming Department of Environmental Quality (DEQ) limit of 2,000 ppm**.

The contamination covered an area **150 feet wide by 250 feet long**, with an estimated **30,555 cubic yards** of affected soil. An initial **excavation-based remediation plan** was deemed impractical due to logistical challenges and high costs, prompting Baker Hughes to seek a **non-invasive, in-situ solution**.

Innovative Remediation Approach:

X4 Environmental Inc. designed a **cost-effective, minimally disruptive in-situ remediation strategy** using a combination of **borehole injection and chemical treatment with X4JH2000**:

1. Strategic Boring & Injection System:

- A **local boring company** drilled holes at **45° and 90° angles**, covering the width of the building.
- **Perforated 3-inch PVC pipes** were installed every **six feet** and interconnected into a **manifold system**.

2. Chemical Injection & Aeration:

- **X4JH2000**, a proprietary hydrocarbon remediation agent, was **injected into the manifold system**.
- An **air compressor** was connected to force the **chemical-water blend into the contaminated soil**, promoting **deep penetration and enhanced microbial degradation**.

3. Immediate & Long-Term Impact:

- The **highway-porous soil** allowed **rapid absorption**, visibly changing the **soil color** and significantly reducing **hydrocarbon odors** within **hours**.
- TPH levels dropped **91% within eight hours**, demonstrating **immediate remediation effects**.
- Continuous **monitoring over 24, 48, and 72 hours**, as well as at **7, 14, and 30 days**, confirmed sustained **TPH reductions**.

Results & Conclusion:

- ✔ **TPH levels reduced by 91% in just eight hours**
- ✔ **Achieved full regulatory compliance within seven days**
- ✔ **Minimized operational disruption—no facility downtime**
- ✔ **Cost savings by avoiding excavation and landfill disposal**
- ✔ **Sustainable, environmentally friendly in-situ treatment**

By leveraging **existing boring technology** and **X4JH2000's advanced hydrocarbon breakdown properties**, **X4 Environmental Inc. successfully remediated deep soil contamination beneath an active industrial site**. This case study underscores the **efficacy of non-invasive, in-situ remediation**, offering a **scalable, cost-effective solution for hydrocarbon-impacted sites**.