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Cenozoic Exploration is a small business enterprise of the state of California specializing in limited access drilling and sampling for the geotechnical and environmental industries. The company owner Jeff Harra has a B.S. degree in Geophysics that he obtained from the University of California Santa Barbara in 1988. After college he worked 4 years as a staff geologist for a civil engineering company supervising drilling, laboratory work, preparing soils reports, providing compaction testing, and foundation observations during construction. During this period, he completed 32 units of masters courses in Geology as well as an additional 8-week geologic mapping course in California, Nevada, and Utah, while attending California State Hayward University. As a small business the drillers, drillers helpers, and staff are exposed to soil, rock, and mineral identification and the processes of geologic deposition, formation, and environment. This consistent source of information and explanation has been a valuable company resource. It is common for Jeff to be questioned about geology and sample identification during exploration and site reconnaissance, even by the most experienced engineers and geologists. The drillers and drillers helpers have various trade backgrounds including construction, plumbing, mechanical repair, welding, house moving, heavy equipment, cold storage warehouse, forklift operating, and trucking. Everyone in our environmental division carries a 40-hour hazmat education and certification.

Jeff's interest in mining geology, geologic hazards, and equipment design, inspired him to develop Cenozoic Exploration In 1993. After

operating commercially available drilling rigs for over a decade,he fabricated and built a crawler mounted drilling rig designed around an available New Holland Agricultural tractor. OOut of necessity for a more powerful, safer, and ergonomic drilling rig for extremely limited access and portability he personally designed and manufactured a hydraulic portable system that has been adapted and revised to the version we use today. Each of these machines fill a specialty niche in the exploration industry.

Equipment and Methodology:

We presently have 5 drilling rig offerings that can be used in combination to achieve your exploration goals. Four of our rigs utilize the ASTM D-1586 cathead and rope sampling method with a 140# safety hammer falling 30 inches to drive samplers connected to continuous drill rods to depth. Our 2018 7822DT Geoprobe is equipped with an automatic trip hammer continuously connected to rods to depth.

Conventional Truck Mounted Drills:

Our truck mounted drilling rigs are mounted on 2018 model year Ford F350 and Ford F550 dual chassis,with modern EPA and smog compliant engines. A Simco 2400 SK-1 long-stroke, model year 2008, is mounted on the F550 and a custom Mobile B24 with 2021 Hatz 50hp deck engine on the F350. These truck mounted drilling rigs can access moderate to steep terrain that is unobtainable to larger machines. They are ideal for accessing unimproved properties, remote access roads, and highway shoulders. On firm terrain they can set up and explore slopes between 3.5:1 and 3:1, horizontal to vertical.Their relatively lower mast heights

enable them to operate beneath trees and overhead obstructions. Their relatively lighter weights are a benefit on softer ground surfaces.

Track Mounted Drills:

Our company-built track mounted drill rig is manufactured around a 2004 New Holland TK80A. It weighs 6 tons, is 4 feet 8 inches wide, 13 feet long, 8 feet high in transit and 18 feet high while operating. This is a steel track skid steer base with conveyor rubber overlays, driven from inside the cockpit for added safety. This diesel power machine is capable of swinging 10 feet auger sections with continuous flights. This drill rig can climb slopes exceeding 2.5:1 horizontal to vertical and can set up and drill at any angle it can position on. With its light ground pressure, it is ideal for soft soils and agricultural fields. Its narrow width and maneuverability also enable it to explore in alleys, adjacent road shoulders, and steeper slopes inaccessible to conventional rigs.

Our flagship machine and newest drilling rig is a model year 2018 Geoprobe 7822DT. It is based upon a rubber track Caterpillar 303 chassis. It has every accessory available including 2 mast winches, auto drop hammer, hydraulic break out table, Monyo 3L6 pump, 4 speed auger drive motor, and direct push liner extruder. We have multiple tooling racks with an integrated vice and tool bench system that is transported by the attached dozer blade. The capabilities include concrete coring, hollow stem augering, direct push, rotary wash, and our newest addition CPT. Both our New Holland and Geoprobe track drills are transported on an extreme duty kingpin air brake trailer manufactured in 2018 by Gatormade Trailer Company. This trailer is pulled with a modern smog compliant 2014 International 7400 Semi truck with front and rear axle drive capability.

