2-18-2014

Space Rock Mining: A Land Rush Without Title

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GOLDEN GATE UNIVERSITY LAW REVIEW

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FEBRUARY 18, 2014 BY RICHARD MIYASAKI 0 COMMENTS

While some might call the idea of asteroid mining a dream of science fiction, there are some very prominent individuals who believe it is not only possible, but also financially and technologically viable. Cofounded by Dr. Peter H. Diamandis (CEO of the X PRIZE Foundation) and Eric C. Anderson (Chairman of Space Adventures), and supported by the technical expertise of scientists, engineers, and professors with extensive experience in space technologies, Planetary Resources intends to make finding, moving, and mining asteroids a reality. The company boasts advisors such as General T. Michael Moseley (Ret.) (former Chief of Staff of the USAF) and film director and adventurist James Cameron, and financial backing from such figures as Eric E. Schmidt, Larry Page, and Richard Branson. I'll leave it to the engineers to figure out if this is technologically feasible, and to the economists to figure out if it is fiscally feasible, but what about legally? Can they do this?

NASA's Near Earth Object Program is currently searching for objects near the Earth's orbit, and to date such programs have found a total of over 10,000 near-Earth asteroids. This staggering number may make it appear like there are rocks aplenty for companies to go and collect, but as recently shown, these numbers may be deceiving. By using a series of estimates, Martin Elvis of the Harvard-Smithsonian Center for Astrophysics has attempted to approximate the number of these objects that are close enough for current conceivable technologies to acquire, and large enough and rich enough in the correct materials to be financially viable. He came up with an estimate of between 10 and 18 objects.

This will make for a very difficult situation if other companies decide to compete with Planetary Resources. Competition over asteroids may become fierce, as they may be a very scarce resource with potential payouts in the billions of dollars. With this competition, how can companies protect title to asteroids, and may they even claim title? The last thing a company would want to do is spend hundreds of millions of dollars to find and then move an asteroid into position for mining, only to have another company swoop in and reap the benefits.

International regulation of space is generally developed by the United Nations Office for Outer Space Affairs and implemented through the various treaties signed and ratified by member nations. For the issue of asteroid mining, only the Outer Space Treaty is of note, in that it both covers issues of claiming territory and has been ratified by major space-faring nations. According to the Treaty, no celestial bodies are "subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means," and the activities of non-governmental agencies must be authorized and monitored by the state with the state bearing responsibility for those actions.

In countries where title is derived from the sovereign (such as the United States, see Johnson v. McIntosh), no title to space objects may be acquired since title begins with the sovereign. In any country where occupation and usage create title, there may be room for a private entity to establish title, but the question remains whether the requirement for authorization and control by the state would prevent such title from being acquired. The Moon Treaty would make this prohibition on title to extraterrestrial property explicit, but it has seen only limited signing and ratification, including no major space-faring nations.

The potential problems arising from this issue get even more complicated when we consider space-based construction. Objects launched into space are considered the property of the launcher, even if the object is assembled in space from parts launched into orbit. However, there is no mention of the manufacture of spacecraft from raw materials in space. If these harvested asteroids are used to make a spacecraft using no material launched from the

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Earth, who would own it? What if people then live aboard this space-built craft? What if colonies are built? Per the Outer Space Treaty, all astronauts are directed to render assistance to each other, but who would be in charge?

These may not be problems today, or for years to come. But given the pace at which technology can advance, and with companies like Planetary Resources (among others such as SpaceX and Virgin Galactic) pushing the envelope of what can be done, these problems may need solutions sooner than we can imagine.

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