

The Health and Environmental Dangers of the Reef Capital Partners Shivwits Golf Course Resort Plan

A research-based analysis opposing unsafe development

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Introduction:

Reef Capital Partners and Black Desert plans to construct three 18 hole golf courses, a practice course, airport, clubhouse and other amenities for luxury resort guests on 1,250 acres of Southern Paiute Tribal Lands at the foot of the Red Mountain which have long been sacred to the Shivwits people.

The Mojave Desert located golf courses will need a colossal amount of year-round water to irrigate the land mass of three 18 hole golf courses and a practice course, not to mention the rest of the planned resorts water needs. Reef Capital/Black Desert have made a secret deal with a few Shivwits Band Council members to take most of the Shivwits people's water rights, thereby circumventing both Washington County's '*no new golf courses in a drought*' rules and the clearly expressed will of Shivwits members. The water ReefCapital/Black Desert will use to irrigate all these golf courses is not clean, safe, potable water, but rather partially treated wastewater (also called secondary wastewater), which contains a large volume of toxin-containing chemical contaminants.

The health-related and environmental consequences long-term use of wastewater-irrigation containing dangerous Forever Chemicals (PFAS), microplastics, nanoparticles, and the large-scale use of pesticides, insecticides, pharmaceuticals, and other chemicals-of-emerging concern (CEC), on golf courses near to Shivwits and Utah residential homes, wells, and waterways and the environmental effects on fish, plants, and wildlife will be devastating.

Overview: Dangers of Toxic Pesticide Applications and Chemically Contaminated Wastewater Irrigation

The proximity and volume of forever chemicals, pesticides, and other emerging contaminants in the air and soil of Shivwits Band Member and Utah residential neighborhoods so close to where young children, elders, and other individuals live is worrisome. The secondary reuse-irrigation wastewater and the large volume of pesticides applied to Reef/Black Desert's proposed golf courses represent quantifiable and demonstrable health risks to nearby Shivwits tribal members, Utah neighbors, and

to Tribal Trust Lands. Decades of credible research confirms that pesticide, insecticide, and herbicide exposure are associated with increased incidences in cancer, neurologic diseases such as Parkinson's, and Alzheimer's [\[1\]](#).

Golf courses use large volumes of pesticides. The DNA repair genes people need to recover from pesticide exposure are weakened with chronic exposure, thereby worsening the effects of pesticide toxicity and activating pesticide-induced diseases [\[2\]](#). Chronic pesticide exposure turns on a genetic switch in humans which is akin to the way smoking turns on a person's genetic risk for lung cancer. Cumulative exposure exponentiates that risk: The larger the dose, the greater the quantity, and the longer the exposure, the worse it is for people living nearby. Unlike those who acknowledge the significant health risks of smoking but choose to smoke anyway, neither Shivwits Members nor their Utah neighbors have any choice about living right next to Reef Capitals many golf courses. This will thus effect them for generations.

In a critical analysis of international scientific literature published since 2013. A strong link was established between pesticide exposure and over twenty pathologies, including brain and motor development disorders in children, neurodegenerative diseases and cancer in children and adults [\[3\]](#). Other studies reveal fetal brain abnormalities in the aftermath of pesticide exposure. A 2025 study in the Journal of Neurology shows the ill effects of the pesticide chlorpyrifos, which is banned in food but is still used by many golf courses and measured in wastewater [\[4\]](#). Chlorpyrifos is associated with disturbances in the brain structure and function and poor motor development in children. Similar health dangers have been found to occur from the whole range of other pesticides, insecticides, and herbicides used on golf courses, even those purporting to use so-called "safe" pesticide practices.

A recent study of 137 golf courses published in the prestigious Journal of the American Medical Association indicated that living within one mile of a golf course is associated with a 126% increased risk of developing Parkinson's disease, with odds decreasing in those living more than six miles away. Pesticides were found to have leached into the groundwater and drinking water near golf courses [\[3\]](#).

Research shows that wind carries drifted pesticide particles from evaporation or spraying. Pesticide drift poses health risks to nearby homes [\[5\]](#). Many other credible studies have documented increased cancer risks for golf course workers and identified the harmful health effects of "pesticide drift" on nearby residents, especially children [\[6\]](#) [\[7\]](#). Despite assurances by Reef Capital and Black Desert to the contrary, the kind, volume, duration and location of pesticide applications to the planned Shivwits golf courses will inevitably represent significant health risks to Shivwits members living near the courses and to Utah neighbors in Ivins, all of whom will live within one mile of three

pesticide-infused golf courses. Shivwits land has ubiquitous, gusty winds. The area's soft red dirt silt, also known as particulate matter, is more likely to blow in wind than the thicker, heavier soil found elsewhere.

Particulate matter from secondary wastewater contains forever-chemicals, pesticides, microplastics, nano-plastics which are increased by secondary wastewater treatment. The EPA's 2019 report on particulate matter details many harmful effects of particle pollution, including increased mortality in infants, increased hospital admissions for heart attacks and strokes, increased hospital admissions and emergency department visits for chronic obstructive pulmonary disease, and increased severity of asthma attacks and hospitalization for asthma among children [\[8\]](#) [\[9\]](#).

The health risks to Shivwits members and their Ivins area neighbors will continue well after the construction phase of the resort, when ongoing applications of pesticides and secondary wastewater irrigation will routinely aerosolize a large amount of toxic forever-chemicals ([PFAS](#)), pesticides, and other chemicals of emerging concern. Chemically contaminated dust and particulate matter pollution will be generated by strong and variable winds and dispersed to the surrounding residences on the reservation and in Ivins. According to the EPA, there is a "clear relationship between long-term exposure to particulate matter and mortality" [\[9\]](#). The EPA also states PFAS exposure can occur "breathing air containing PFAS." The spread of particulate matter by air is influenced by wind and precipitation [\[9\]](#). Science is clear on the aerosolization of leftover secondary wastewater toxins (including forever chemicals and pesticides) as chemically laden particulate matter and fugitive dust.

Valley Fever is a serious, life-threatening, and sometimes fatal respiratory infection caused by a rare fungus in soil which, once disturbed by construction, becomes airborne and affects the lungs of exposed individuals [\[10\]](#). Constructing a resort, multiple golf courses, and perhaps even an airport on Shivwits Trust Lands will inevitably cause an increase in Valley Fever cases, which has already occurred near Black Desert's other golf course resort in Ivins.

Health Impact of PFAS/Forever Chemicals from Secondary Wastewater Irrigation:

Here are the basics: Environmental Protection Agency (EPA) findings confirm the quantity, volume, and seriousness of health problems caused by Forever Chemicals in secondary wastewater irrigation. Despite that data, Reef Capital plans to take half of Shivwits treaty entitled secondary water for use on its new golf courses. This secondary water is not safe drinking water, potable, or tertiary water, but instead, is PFAS-and pesticide containing [\[11\]](#). To make matters worse, the pesticides themselves contain PFAS in significant, measurable amounts, further quantifying the dangers of routine golf

course irrigation and chronic pesticide applications.

Forever chemicals, which are leftover and even increased by the sewage treatment process and present in the wastewater used for golf course irrigation, cause health problems including: an increased lifetime incidence of heart disease, lung disease, diabetes, cancer, autism, low birth weights, birth complications, decreased bone growth, liver problems, developmental defects, diabetes, a lowering of childhood IQ, and reproductive dysfunction [12]. The extensive health and environmental impacts of PFAS are of particular concern to residents of Tribal communities such as the Shivwits Band of Paiutes who already suffer systemic health disparities as compared to nontribal individuals and are “disproportionately burdened by diseases and experience lower life expectancy compared to non-Native individuals” [13].

So, even tiny volumes of Forever Chemicals are hazardous to Tribal and US residents: They can cause serious diseases by being ingested, inhaled, and absorbed through the skin. PFAS can be found in drinking water, but levels are now regulated. They can be found in secondary wastewater, but levels are much higher and not yet regulated. Interestingly, studies show that PFAS levels increase during the wastewater treatment process and thus are found in greater quantities in treatment facility output than input. Some residents in communities adjoining the planned golf courses plan to follow EPA recommendations and have their blood drawn before and after Black Desert golf course construction and at regular intervals thereafter to measure their PFAS-related health risks. There will surely be lawsuits.

Local archaeologists concur with Shivwits elders: the land slotted for golf courses is not only Sacred Land to Band Members but has already been confirmed to contain ancestral burial remains and important cultural artifacts. Burial remains and cultural artifacts have already been disturbed by Black Desert employees assessing the land. To a non-Indian, these are predominantly religious and cultural aspects of the land, rather than solely environmental. But to the Shivwits people, the land, water, creatures, plants, fish, bees and birds are all interconnected. What affects one impacts the others. The environmental consequences of Black Desert's three golf course resort on water sources and area soil will be severe.

The direct adverse ecological influence of chemicals of emerging concern, pesticides, and forever chemicals on wildlife behavior, ecology, and evolution have proven to be considerable [14]. It turns out that “the effects of long-term low level chronic exposures” such as one would find with long term pesticide applications and chemical contaminated wastewater irrigation “can be equally deleterious” to animals and the environment. [15]. PFAS can move with percolating water into deeper soil layers and also reach groundwater reserves. This migration can be relatively rapid (as seen, for example, with

short chain PFAS) or may take decades (such as with some long chain PFAS, e.g. (PFOA and PFOS) [16]. Unfortunately, the very same short chain PFAS proven to rapidly percolate into soil layers and groundwater are those created and increased by wastewater treatment in Washington County and elsewhere. The Shivwits Trust Land soil, groundwater, and wells will be at greater risk for more rapid accumulation of PFAS and Pesticides than soil or water elsewhere. These wells provide drinking water to the tribe and to nearby communities.

There is toxicological evidence that some PFAS have adverse reproductive, developmental and immunological effects in animals and humans. From the CDC toxic disease registry summarizing the literature on how PFAS adversely affect animals: “These animal studies have found that PFAS can cause damage to the liver and the immune system. PFAS have also caused low birth weight, birth defects, delayed development, and newborn deaths in lab animals” [17]. According to the National Institute of Health, PFAS exposure harms plants by inducing “further damages plant cell structure and organelle functions”[18].

The USGS has found harmful chemicals in groundwater, especially in at-risk landscapes which evidence fractured rocks such as that of the Shivwits Trust Lands. Rainstorms on the Shivwits Reservation are so frequently torrential that the Red Mountains above the planned golf courses form cascading waterfalls. This volume of rain rivets through landscapes and will pour downhill over the top of golf course greens, pulling red dirt and pesticide and wastewater residue into streams of water, discharging chemical contaminants downhill into groundwater, wells, and the Santa Clara River. The clay liners some courses use can reduce, but do not eliminate the risk for groundwater, well, and aquatic contamination, especially in the context of year-round torrential downpours.

Using chemically contaminated secondary wastewater irrigation and pesticide applications over the extensive land mass used by three golf courses on Tribal Lands will be dangerous to people and devastating to the environment. Hazardous quantities of Forever Chemicals/Pesticide/Insecticide/ and Herbicide residue will be found in irrigation water, within the soil, and in the air to which Shivwits community members and their Utah neighbors will be exposed. Associated diseases and environmental damage are a certainty.

Conclusion:

As nursing clinical consultant and community health advocate and a pediatrician and geneticist, we join the majority of Shivwits Band of Paiutes Members who oppose the Reef Capital Partners/Black Desert’s planned golf course development on Shivwits

Sacred Lands. We believe economic opportunities for the Shivwits must co-exist with robust health, environmental, and legal protections. Reef Capital Partners planned golf course development will harm the health and wellbeing of Shivwits Band of Paiutes Members and their Ivins neighbors and damage water quality, plants, animals, bees, and fish of the Red Mountain environment.

Further, we support the right of the Shivwits people to vote for or against the development, to have complete transparency about the contents of the Reef Capital/Black Desert development agreement, to vote for or against band council candidates of their choice and have that vote matter, and to petition their band council according to the Paiute Indian Tribe of Utah Bylaws and Constitution.

The rogue Shivwits Band Council has disempowered the Shivwits people, invalidated their Constitutional rights, secretly met with and signed a development contract with Reef, attempted to pass an Act of Congress removing legal and voting rights from Shivwits Members, ousted the newly elected Band Council Chairman without cause, repudiated Paiute Indian Tribe of Utah instructions to reinstate him, refused to accept petitions for an Initiative and Referendum to stop the development, disallowed valid petitions to recall band council members, and is now attempting to unilaterally, without a vote of the Shivwits people, secede from the Paiute Indian Tribe of Utah. These actions have disenfranchised the Shivwits people from their voting rights, reduced their legal protections and sovereign rights, and handed control over invaluable trust lands and water rights to a non Indian private equity firm planning to build a dangerous and environmentally hazardous golf course resort on sacred lands containing ancestral burial remains.

Every enrolled adult Shivwits band member needs the opportunity for informed consent about the significant health and environmental dangers of Reef's massive development, transparency about the content and consequences of bills and agreements made on their behalf, and the chance to vote for or against the development in a properly conducted election, held in accord with the Paiute Indian Tribe of Utah Bylaws and Constitution.

Sincerely,

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