

An aerial photograph of a desert landscape, likely in Utah, showing a winding river and a large industrial facility. The image is overlaid with a semi-transparent orange filter. The title text is arranged in five horizontal teal bars, each containing a word in white, italicized, serif font.

A LOOK AT EASTERN UTAH'S POTASH INDUSTRY

THREATS TO OUR WATER,
MARKET SPECULATION,
AND A BLUEPRINT
FOR RESPONSIBLE
MANAGEMENT

A LIVING RIVERS REPORT

EXECUTIVE SUMMARY

The Bureau of Land Management (BLM) is currently preparing a management plan – known as the Moab Master Leasing Plan – to govern oil, gas and potash leasing and development on approximately 750,000 acres of public lands in eastern Utah. In this report, we detail the important environmental and economic risks of increased potash development and outline strategies for mitigating these risks by adopting responsible zoning decisions, best management practices, and other measures.

Definition: Potash is a type of salt used mainly as a fertilizer.

Under its most recent proposed plan, the BLM estimates that each year potash development would require about 2.8 billion gallons of water. These enormous water demands would impose a considerable burden on the Colorado River Basin where existing supplies are already depleted and demand for water is projected to rise.

Water availability is not the only problem. Low potash prices and market volatilities make future development risky. Market downturns, which have been frequent for potash, could halt operations and leave behind abandoned facilities and infrastructure. Potash development could also negatively impact existing, stable economic output. Outdoor recreation on public lands around Moab – hiking, biking, rafting, jeeping, sightseeing, to name a few – continue to provide sustainable and durable economic growth to local communities. These critical economic contributors must be protected as the BLM seeks to increase potash development around Moab.

While the challenges are many, there are a few concrete steps the BLM can follow to mitigate the impacts of proposed potash development. For starters, because of the water demands and the economic risks involved, BLM should carefully regulate any future potash development on the public lands around Moab. Requiring companies to prove the economic viability of their operations before development is initiated would help ensure proposed developments won't result in abandoned operations with a myriad of impacts to air, water and the local economy. Also, imposing robust protections for air and water quality during production activities, along with strict reclamation and mitigation requirements would help alleviate some of the environmental risks. These types of "best management practices," along with others outlined in this report, are critical to any responsible potash development plan for the public lands around Moab.

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POTASH AND WATER: THE LAND OF DIMINISHING RETURNS



Solar evaporation near Moab, Utah. Solar evaporation involves the use of the sun to evaporate water and precipitate salt in the solution.
Photo: Ecoflight

POTASH PRODUCTION IN UTAH

There are two main methods for developing potash – solar evaporation and crystallization. Both require enormous quantities of water.

Utah produced about 210,000 tons of potash in 2014, less than 1% of the total global supply. Production from lands near Moab is expected to increase regardless of whether BLM chooses to maintain

its existing plan or adopt a new proposed plan for the area. Under the “business as usual” approach, production would increase by roughly 160,000 tons/year in Eastern Utah, while the agency’s “preferred” plan would increase production by about 90,000 tons/year. In either scenario, potash development would strain critical water resources and create significant environmental impacts to the Colorado River.

A LOOK AT EASTERN UTAH'S POTASH INDUSTRY POTASH & WATER: THE LAND OF DIMINISHING RETURNS

CONFLICTING DEMAND FOR A FINITE RESOURCE: DROUGHT IN THE COLORADO RIVER BASIN

Potash development must be weighed against water demands and limitations in the Colorado River Basin. The Bureau of Reclamation has determined that since 2003, the 10-year average consumptive use of water in the Colorado River Basin has exceeded the 10-year average supply. We are using more than we have.

Utah, the second-driest state in the nation, anticipates its population of 3 million will nearly double by 2050, further straining existing supplies. Yet, by 2050, runoff of the upper Colorado River is projected to decrease by as much as twenty percent. A drier climate will further challenge water providers' ability to meet projected demands.

Yet, under even under the BLM's more restrictive proposed plan, agricultural water from ranches and farms would almost certainly need to be diverted to potash development.

BY THE NUMBERS: WATER FOR POTASH

4.6 BILLION GALLONS

water demand under the existing potash leasing structure

2.8 BILLION GALLONS

water demand under BLM's preferred planning alternative

1.5 BILLION GALLONS

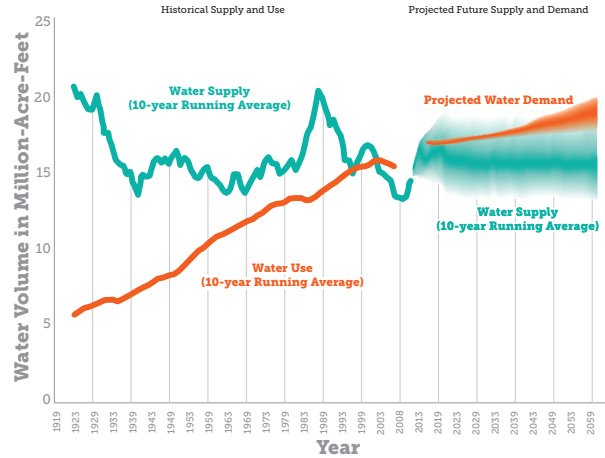
Grand County and San Juan County residents' annual domestic water use

24,680 PEOPLE

population of Grand County and San Juan County

Source: Bureau of Land Management

COLORADO RIVER WATER SUPPLY, 1919–2059



Source: Bureau of Reclamation Colorado River Basin Water Supply and Demand Study

BY THE NUMBERS: UTAH'S ECONOMY AND THE COLORADO RIVER

969,735

Utah jobs dependent on the Colorado River annually

\$69.79 BILLION

Utah's gross state product dependent on the Colorado River (50% of Utah's GSP)

\$43.30 BILLION

labor income dependent on the Colorado River each year

\$1.4 TRILLION

annual economic benefits the Colorado River generates in the 7 basin states.

2/3

annual gross state product could be lost if Colorado River water was no longer available to businesses, industry, and agriculture.

16 MILLION

number of jobs that could be lost per year if river flows are significantly reduced, resulting in a loss of \$871 billion in labor income.

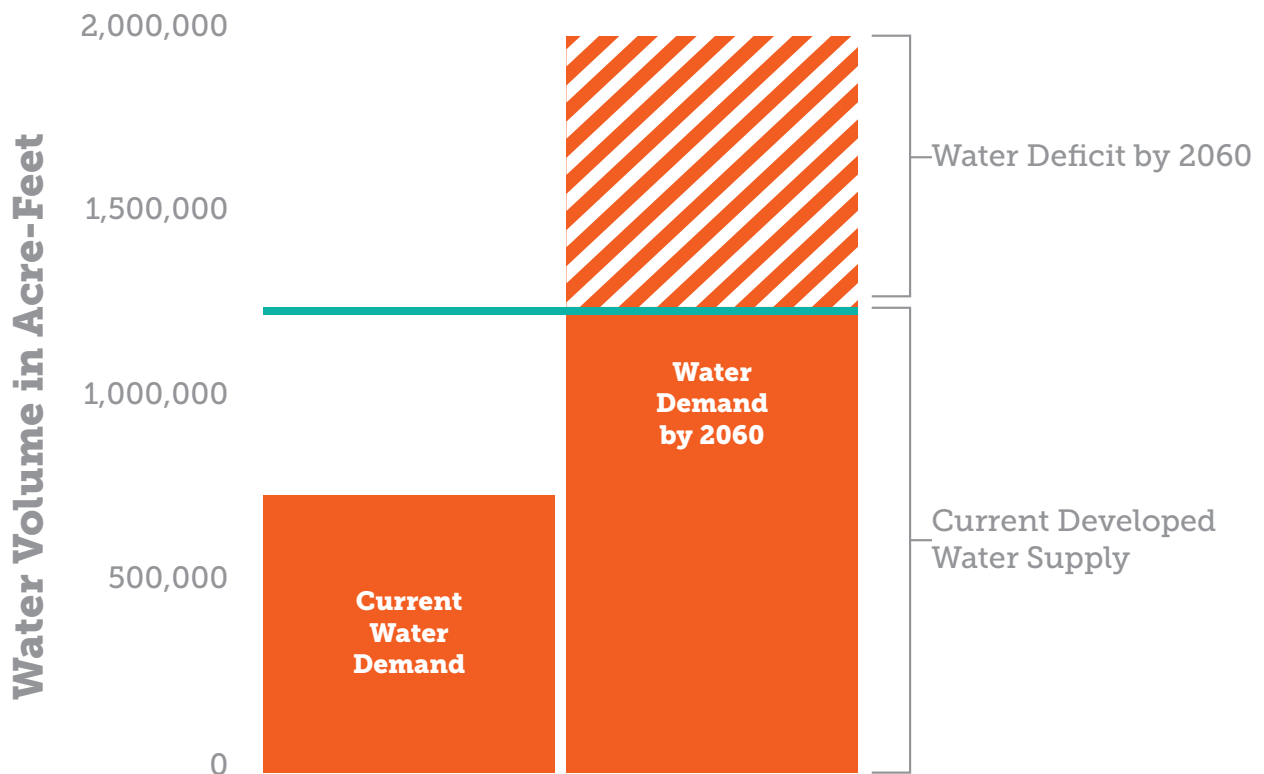
Source: Protect the Flows, University of Arizona report

UTAH IS ONE OF THE DRIEST STATES IN THE NATION.

Our water is precious, and developing new supplies will cost billions of dollars. If we want our children, grandchildren and new neighbors to be able to live here, we need to decide where the water will come from. Will we use less, take water from agriculture, or develop new supplies?

—ENVISION UTAH

PROJECTED WATER DEMAND WITHOUT REDUCING CONSUMPTION



Source: Utah Division of Water Resources

UTAH'S CHALLENGE: MEETING FUTURE WATER DEMAND

Utah faces significant challenges as its population grows. A 2014 report by Envision Utah found that 85% of Utahns believed per person water use should decrease to meet future demands. They also felt that agricultural water should not be sacrificed for municipal and industrial uses. However, that's exactly what more potash development would require.

"Potash development undermines critical water saving strategies. Diverting agricultural water supplies or using new diversions for potash development would compromise the critical balance the state is seeking to achieve to meet future water demands."

—JOHN WEISHEIT, RAFT GUIDE AND DIRECTOR, LIVING RIVERS

POTASH ECONOMICS: NEED TO BALANCE INTERESTS AND PROTECT RESOURCES

MOAB: RECREATION AND POTASH

The public lands in and around Moab, Utah support a range of recreation and other activities that drive the local economy. Arches and Canyonlands, two of our most iconic national parks, bring visitors from around the world to Moab every year. The United States Bureau of Land Management (BLM) is finalizing plans that seek to balance uses, including some allowance for potash development. However, the potash industry in Utah is highly uncertain and subject to price uncertainties that stymie sustained development, so the BLM's long-term strategies must protect our resources and the valuable recreation economy.

RECREATION: THE ECONOMIC BACKBONE OF THE MOAB REGION

The BLM has concluded:

- The Moab area "experiences a high number of seasonal visitors and an intense demand for recreational activities." The BLM estimates that each year more than 964,000 tourists visit public lands in and around Moab.
- **Recreational activities include:** camping, hiking, photography, ballooning, hunting, canyoneering, jeeping, scenic driving, mountain biking, canoeing, rafting, rock climbing, and horseback riding.
- The economy of the area is heavily dependent upon recreation-based businesses.

FACTS AND FIGURES: POTASH MARKET

- Approximately **85 percent** of U.S. potash sales are to the fertilizer industry.
- Like many mineral resource markets, **the potash market is highly unstable.**
 - For example, due to increased consumption in India and China, the price of potash rose from \$100 per ton in 2004 to more than \$900 per ton in 2008.
- With the recession, **the potash boom went bust** and prices fell precipitously.
- From 2011–2012, prices ranged from \$375–\$450/ton.
- **The price now hovers around \$300/ton, and is expected to go lower.**

(primary source: BLM)

"Moab and Grand County is our home. We need a balanced approach on our public lands if we want responsible energy development, a healthy outdoor recreation industry, and beautiful, wide-open landscapes. Our quality of life depends on the long-term health of our lands and rivers."

–JOHN WEISHEIT

ECONOMIC CONTRIBUTION: POTASH* VERSUS RECREATION AROUND MOAB

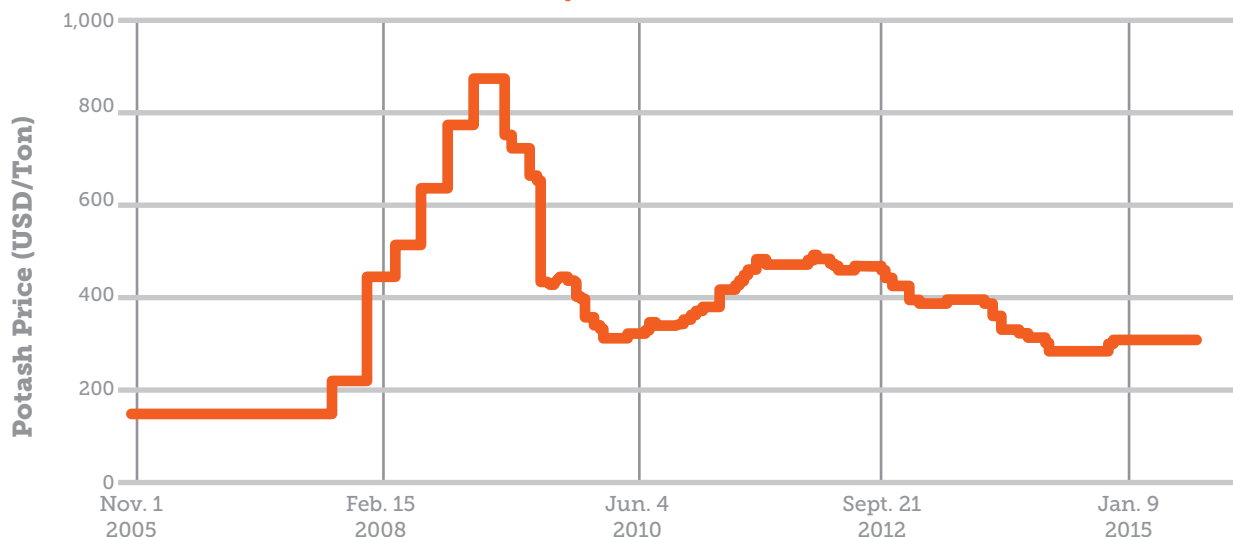
| | Total economic output | Labor earnings | Average jobs per year |
|-------------------|-----------------------|----------------|-----------------------|
| Potash | \$668 million | \$177 million | 259 |
| Recreation | \$761 million | \$447 million | 1,086 |

* Potash figure represents BLM preferred planning alternative

A LOOK AT EASTERN UTAH'S POTASH INDUSTRY

POTASH ECONOMICS: NEED TO BALANCE INTERESTS & PROTECT RESOURCES

POTASH PRICES, 2005 THROUGH 2015



source: InfoMine.com

POTASH PRICE VOLATILITY

1. **Potash prices are volatile.** In addition, to be profitable, sufficient investment capital is needed, up to \$2.99 billion, to successfully develop potash mines.
2. **\$2.99 billion is more than 3.5 times the size of total economic output** in Grand and San Juan Counties combined in 2012.
3. **The uncertainty over future potash prices** may make raising this much investment capital problematic. The capital costs exclude infrastructure costs such as pipelines, roads, power lines, and importantly, rail access. These additional necessary infrastructure costs could increase overall development costs significantly.
4. Estimates for new production facilities in Saskatchewan, with potash deposits at shallower depths than the potash deposits in the Moab area, require a market price of over \$400 per ton to be economically viable.
5. Expansion of existing facilities requires a price of approximately \$200 per ton to be economically viable, resulting in a **potentially competitive disadvantage** for new facilities in the Moab area.

(source: BLM)

“Potash prices have been in a multi-year slump....In fact, [analysts] think it will get significantly worse. Analyst Daryna Kovalska is calling for an average potash price of just under US\$254 a ton next year, down from more than US\$300 today, citing ongoing weakness in agricultural commodities and depreciating currencies in emerging markets.”

—FINANCIAL POST,
SEPTEMBER 21, 2015

POTASH DEVELOPMENT: DOING IT RIGHT

PROTECTING UTAH'S WATER, AIR AND QUALITY OF LIFE

The public lands in and around Moab, Utah support a range of recreation and other non-consumptive activities that drive the local economy. To protect these activities and the local economy, recreation and conservation organizations have called on the U.S. Bureau of Land Management (BLM) to prohibit, or carefully limit, potash development in this area. Any development that is allowed must protect our resources and communities. This section outlines those parameters.

DOING IT RIGHT

Only through careful planning can we help mitigate unwanted impacts from potash leasing and development. "Doing it right" entails:

1. Zoning
2. Proof of Economic Viability
3. Best Management Practices

ZONING

Similar to land use requirements in a residential or commercial zone, the BLM implements critical zoning requirements that give rise to and shape development activities. For potash development on federal land, effective zoning should include:

- a. **Implementing a phased leasing approach.** Exploration and development should first proceed on, or adjacent to, the existing leases in the proposed Upper Ten Mile Potash Leasing Area before leasing and permitting are allowed elsewhere.
- b. **Requiring that leases be diligently developed.** Unlike federal oil and gas leases, which expire after ten years in the absence of production, federal potash leases customarily have an indefinite life-span and never expire. Around Moab, potash leases should, like oil and gas leases, expire after ten years in the absence of production so that once-leased lands can be devoted to other uses that provide more value and revenue to the public.
- c. **Ensuring that potash processing is only allowed in designated areas.** Potash processing—which consumes a significant amount of water and leaves a large footprint on the land—should be limited to carefully-

selected designated areas and not allowed within wilderness-quality lands, National Parks viewsheds, 3-miles of the Green or Colorado Rivers, or popular recreation sites, for example.

PROOF OF ECONOMIC VIABILITY

Public lands in the western United States are riddled with abandoned mining operations, too many of which pollute our rivers and streams. To mitigate the likelihood that mines will fail and be abandoned, companies must prove quantitatively that their operations will sustain commercial development. "Proof of economic viability" should require that:

- a. Lessees prove their operations would provide a positive economic return after all costs of production, including capital investment, have been met.
- b. BLM include stringent reclamation requirements in leases, and impose sufficient bonding on lessees to protect taxpayers from operational impacts.

BEST MANAGEMENT PRACTICES

Best management is a framework to help ensure development will not result in undue degradation of the affected environment. Best management practices must include no less than:

- a. Protecting local community members by ensuring that compliance with federal and state water quality and air quality standards is specifically mandated and achievable.
- b. Prohibiting development within the viewsheds of Arches and Canyonlands National Parks.
- c. Requiring developers to identify the water demands, sources of water, and impacts on existing uses resulting from the diversion of water for potash development.
- d. Minimizing to the greatest extent technologically feasible surface disturbance, road impacts and waste.
- e. Stipulating that plans of development specify how water, air and other resources would be protected.