



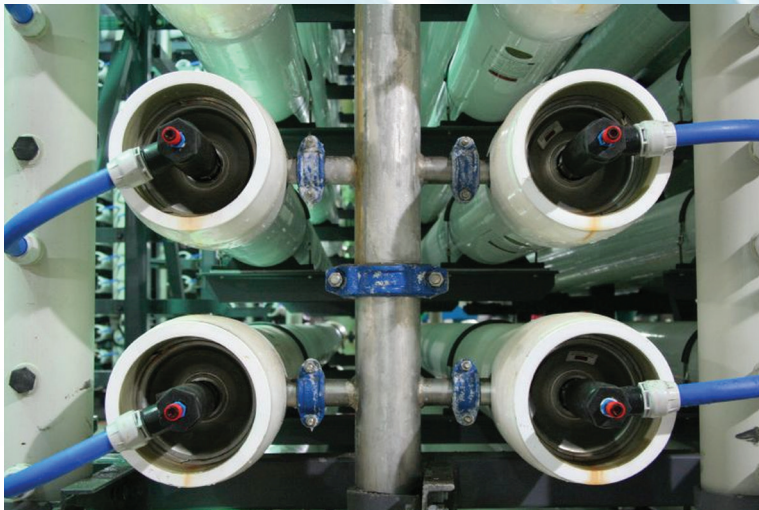
**THE BEGIN-SADAT CENTER
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**Bar-Ilan
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Water, Trump, and Israel's National Security

Donald D.A. Schaefer



Mideast Security and Policy Studies No. 147

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Cover image: Filter tubes at the Ashkelon desalination plant, photo by
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Water, Trump, and Israel's National Security

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EXECUTIVE SUMMARY

Access to potable water is critical for Israel's future, yet the country depends more and more on its desalination plants, aquifers, and water from outside its borders. Pollution and other factors may jeopardize water supplies as Israel extracts oil and natural gas on and off its coast. American oil and natural gas firms, with the assistance of the Trump administration, may pressure the Israeli government to allow the extraction of these resources in exchange for additional assistance. Jerusalem must put access to potable water at the forefront of its national security goals.

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Water, Trump, and Israel's National Security

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INTRODUCTION

Few resources are more valuable to a nation than its water and energy supplies. Israel will soon reach a point at which the government will have to decide which to put first: water or energy.

The struggle is how best to preserve Israel's potable water given the continued demand for energy resources, including from American-based companies pushing the Trump administration for greater access. Israel's natural resources can generate immense wealth, but at a steep price – the possibility of contaminating aquifers, the Sea of Galilee, the Jordan River, and much of the water flowing through the National Water Carrier (NWC) – in addition to affecting Mediterranean desalination plants. The Israeli government must put access to potable water at the top of its list of national security goals and forsake any attempt by the Trump administration to open its energy reserves to development and extraction.

THE POLITICS OF CHANGE

US President Donald Trump has promised far-reaching support of Israel while adopting a standard approach towards a hallmark of US foreign policy – a two-state solution to the Israeli-Palestinian conflict – even with the scheduled move of the US embassy from Tel Aviv to Jerusalem and the recognition of Jerusalem as Israel's capital. But Israel is also going through a period of change. It stands at a crossroads between potentially enormous financial gain through the extraction of oil and natural gas and the long-term goal of ensuring access to potable water.

Historically, Trump has pushed aggressively in pursuit of new resources¹ and Israel's vast oil and natural gas supplies may be an area that could pay off dramatically for US oil and natural gas companies, to the detriment of Israel's clean water supplies. Trump's clear support for the energy industry was vividly illustrated by his choice of Scott Pruitt, an ally of the fossil fuel industry, as head of the Environmental Protection Agency (EPA), and of Rex W. Tillerson, the former chief executive of Exxon Mobil, as secretary of state² (though Tillerson has since been replaced). The Trump administration has also rejected the rule that required oil and natural gas companies to report payments made to foreign countries in which they operate, including Israel.³ Giving American companies access to Israel's oil and natural gas reserves, including in the Golan Heights as well as the coastal region, may be part of a quid pro quo for continued US aid. As noted in *The Washington Post* on February 14, 2017, Trump has proposed massive cuts to the US foreign aid budget, \$3.1 billion of which consists of aid to Israel.^{4,5}

POTABLE WATER AND THE GROWTH OF DESALINATION

Israel's population continues to increase. According to the Central Intelligence Agency's *World FactBook*, Israel has a population of 8,174,527. In addition, approximately 21,000 Israelis live in the Golan Heights and approximately 201,000 in East Jerusalem.⁶

Israel's future depends on access to sustainable levels of potable water.⁷ Further, its supply depends on waters that flow into Israel from Lebanon, Syria, and Jordan. In addition to possible political repercussions, the supply from desalination plants could also be affected by a major oil spill occurring along its coast.

Water is a key element of survival. Israel has relied upon the NWC, created in 1964 (a 130-kilometer canal and pipeline system), to bring water from the Sea of Galilee to areas including Tel Aviv and Haifa and as far south as the Negev Desert.⁸ As Parks states, "Israel is supplied from varied sources, including surface water (30% of potable water), desalination, natural springs (34% of potable water), and groundwater sources (36% of potable water)."⁹

Climate change contributes another factor for Israel and the rest of the Middle East. According to *The New York Times*, 2016 was the hottest year on record.¹⁰ The melting Arctic permafrost will have a dramatic effect on Israel through its contribution to rising temperatures and the release of methane and other greenhouse gases.¹¹ The Trump administration has also attempted to relax laws governing the release of methane into the environment.¹²

Climate change has already led to water insecurity throughout the Middle East, including in Israel and in neighbors Jordan, Syria, Lebanon, and Egypt.¹³ Scientists estimate that by 2050 the Mediterranean basin will experience a “30-50% decline in freshwater resources as a result of climate change.”¹⁴ The extreme heat will affect Israel’s rivers, the Sea of Galilee, and much of Israel’s agriculture industry. Climate change will also have a dramatic effect on Israel’s relations with the Palestinians as potable water grows ever more scarce. In this sense, climate change represents a “threat multiplier” as potable water levels become dangerously low – not only within Israel but also around the Middle East.¹⁵ Even where there is potable water, pollution and contamination affect it throughout the Mediterranean countries.¹⁶

In 2016, Israel struggled with yet another drought that affected the Sea of Galilee. As one article points out, “the water shortage in northern Israel is the worst in 100 years.”¹⁷ The reality is that the water throughout much of Israel and those areas under its control is running out. The unknown is how long it will take before Israel’s coastal aquifers are no longer usable due to seawater intrusion and pollution. The aquifer that supplies Gaza is expected to be exhausted by 2020. In addition, as Lazarou points out, the coastal aquifer, which is

located under the coastal plain of Israel, the Gaza Strip and the Sinai Peninsula (Egypt) ... has faced problems such as pollution from agricultural chemicals, increased sea-salt buildup and over-pumping. In 2012, the UN Country Team reported that the groundwater levels in the aquifer had fallen below sea level, leading to seawater and sewage infiltration, rendering 90-95% of the water unfit for human consumption.¹⁸

Tsur has pointed out that the increased use of desalination may help reduce the risk of seawater intrusion into the coastal aquifer.¹⁹ Groundwater being used within Israel, the West Bank, and Gaza has continued to be depleted faster than it can be replenished. This groundwater should be seen as a bank that should be preserved as a backup for water from desalination plants and/or other resources.

The one bright spot is that Israel has become a world leader in the process of desalination. For nations around the world, desalination may be a game-changer for transboundary hydro-politics.²⁰ But because Israel can now produce large amounts of potable water through desalination, many Israelis no longer believe there is a water shortage, which is producing a diminished perception of the need to conserve and manage Israel's water supplies. As Katz points out, "[t]he lesson for water managers is that special care needs to be taken to ensure that provision of increased supplies does not undermine conservation objectives."²¹ Desalination, therefore, while alleviating much of the water crisis in Israel, must go hand-in-hand with continued efforts to conserve water.

Desalination plants also have effects on the Mediterranean environment.²² Israel will need to continue to address environmental damage from desalination as the plants become the foundation for the country's current and future water supplies due to global warming, population growth, and groundwater depletion.

Regardless of its sources, it is critical that Israel continue to become more self-sufficient when it comes to water.²³ The desalination plants are essential, but if they are affected by hostile actions or environmental events, Israel's capacity to produce potable water would also be affected.

ISRAEL'S NATURAL RESOURCES AND THEIR IMPACT

Access to fuel, in the form of coal, oil, or natural gas, with limited contributions from solar and wind technologies, has also been critical to Israeli security.²⁴ Israel is at the beginning of a massive oil and natural gas boom but is struggling to find a balance that will ensure its continued survival. Part of this balance is between the need to provide its citizens with water and to access the wealth of both offshore and onshore energy reserves. The US is experiencing a similar oil and natural gas boom due

to the extensive use of hydraulic fracturing. The potentially catastrophic effects these extraction techniques may have on limited water supplies should give Israel pause.

Israel's Oil and Natural Gas Resources in the Mediterranean

Recent discoveries of oil and natural gas in the Mediterranean Sea have caused nations throughout the area to realize that there are vast sums of money to be made from their extraction. For Israel, that wealth is expected to reach \$100 billion over the next twenty-five years, which will in turn transform Israel into a net energy-exporting nation.²⁵ The Palestinians, too, are finding that wealth off the coast of Gaza can ensure that it is energy self-sufficient.²⁶

Yet Israel, for all its newfound potential wealth in energy reserves, appears to have very little infrastructure to fully utilize the oil and natural gas reserves in such a way as to maximize financial gain. This has resulted in cooperation with other nations to transport its energy resources to places where it might be exported further, notably the December 2017 Italian-Greek-Cypriot-Israeli agreement on the construction of a gas pipeline from newly discovered fields in the eastern Mediterranean to Europe. Known as East Med, the project involves a 2,000-kilometer-long pipeline to channel offshore reserves in the far-east corner of the Mediterranean to Greece and Italy, at a cost of up to 6 billion euros, in what was described as a “very important pillar” in the eastern Mediterranean natural gas corridor.²⁷

For domestic purposes, Israel may simply bring its natural gas directly into use. It has already made deals with foreign companies for technology and resources for exploration and extraction of its oil and natural gas reserves, but with a dramatic potential cost to its water supplies.

Israel is estimated to have 1.7 billion barrels of recoverable oil and 122 trillion cubic feet of recoverable gas in its offshore field.²⁸ In 2016, the Netanyahu government argued before the Israeli Supreme Court to permit a deal between Texas-based Noble Energy and Israel's Delek Group for the Leviathan oil field and its reported 622 billion cubic meters of natural gas. The field will cost \$6 billion to develop and is expected to begin production in 2020.²⁹

If Israel's energy acquisition were to experience a catastrophic oil or natural gas spill – caused naturally or by accident (on the scale of the 2010 Deepwater Horizon oil spill off the coast of Louisiana³⁰) or by a terrorist attack – it would impact its entire energy infrastructure.

It is essential that the potential impact of a major oil spill along Israel's coast on its desalination plants be understood. A recent article by Malek and Mohamed stated,

The Middle East is the one place in the world uniquely positioned to have highest concentration of both desalination and oil facilities, thus providing many opportunities to find and study the impact of oil on desalination plants. In recent years, apprehension has been deepened about the oil contamination of intake seawater caused by the effusion of oil from tankers, oil fields and oil refineries, and the establishment of measures to prevent oil contamination has become a matter of urgency. If the present conditions are left to continue as it is, not only the efficiency of the seawater desalination plants will fall due to contamination of the facilities, but also the product water itself will be polluted, *causing the complete stop of the potable water supply.*³¹

Malek and Mohamed's analysis points to the very real damage that could be caused to Israel's desalination plants should a significant oil spill occur off its coast. Given the increased traffic in oil rigs, barges, and other vessels (and piping carrying oil to Israel), Israel needs to prepare the desalination plants and take the necessary precautions to limit spills and pollution. While further studies need to be done to determine exactly how a major oil spill would affect Israel's desalination plants, Malek and Mohamed continue:

Oil is a threat for two primary reasons; first, it contains pollutants not normally found in seawater that desalination facilities do not normally have to remove. For instance, benzene is a human carcinogen contained in oil that cannot exceed 5 ppb [parts per billion] in potable water. Continued operation of desalination plants with even a small amount of processed benzene could pose a threat to public health. Second and perhaps the most obvious reason is the damage it can do to seawater intake filter and heat exchanges. Oil

in seawater can take the form of the well recognized slick, but it can also form large tar balls and sunken oil globs that can be drawn into intake filters.³²

Hydraulic Fracturing and Continued Access to Water

Shale deposits have been known to exist in Israel for some time,³³ but only recently have researchers discovered methods for economically extracting oil and natural gas. When considering the use of hydraulic fracturing to access the massive oil and natural gas reserves underneath the Golan Heights and much of Israel and the West Bank,³⁴ Israel needs to look ahead over the next twenty or even one hundred years.

The Golan Heights, where water flows from the tributaries and Upper Jordan River to the Sea of Galilee, requires special attention. It is important for two reasons: first, Israeli localities and its military presence allow for direct control of the upper Jordan River and as a buffer zone against Syria; and second, Syria's desire to regain this strategic area is longstanding, and the Golan's natural resources, including water and now gas and oil, increase the likelihood of confrontation with Israel. As Alster states:

After Israel complained for years that it was surrounded by oil-rich states but didn't have a drop within its own borders, it appears there's a big-time turnaround with the announcement Wednesday that massive oil reserves have been located in the Golan Heights, close to the country's border with Syria.³⁵

The Wall Street Journal sees potential for immense wealth:

The World Energy Council estimates Israel's shale deposits, located some 30 miles southwest of Jerusalem, could ultimately yield as many as 250 billion barrels of oil. For purposes of comparison, Saudi Arabia has proven reserves of 260 billion barrels. The United States consumes about seven billion barrels a year.³⁶

But is access to these valuable natural resources worth the price in terms of long-term damage to Israel's water supplies? Shale deposits in the Golan Heights are of special concern given the potential of pollutants,

such as methane from hydraulic fracturing, to contaminate Israeli water resources. These pollutants could infiltrate the Sea of Galilee and spread to much of Israel and the West Bank via the NWC and the Jordan River.

Israel and other countries should require companies involved in hydraulic fracturing to practice an open disclosure policy regarding the chemicals involved and the potential environmental impacts, since the industry views the hundreds of chemicals involved as “proprietary secrets.”³⁷ A key issue are the millions of gallons of fluids used to fracture rock and release oil and gas.³⁸ What will happen to used fluids? Will they be injected deep underground, allowed to evaporate in ponds, or make their way to the sea? Before any further extraction of oil and natural gas from Israel’s vast shale deposits takes place, the government should inspect industry plans and consider the environmental impacts. Israeli citizens have few places to go if contamination affects the potable water supply, including desalination plants.

CONCLUSION

The central struggle for Israel’s long-term future will be balancing the needs for energy and potable water. It is currently unclear whether the Israeli government would yield to a quid pro quo by US-based companies in exchange for financial and/or political support from the Trump administration. The reality is that Israel has sufficient natural gas reserves within the Levant basin off its coast for its domestic needs. Developing these reserves for export will require foreign capital and expertise. But access to potable water must rank first among Israel’s national security goals.

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Notes

- 1 G. Blair, *The Trumps: Three Generations that Built an Empire* (New York: Simon & Schuster, 2000), p. 262.
- 2 J. Ashkenas, “Rex Tillerson’s Maverick Oil Diplomacy,” *The New York Times*, January 11, 2017.
- 3 B. Plumer, “Trump signs his first significant bill - killing a transparency rule for oil companies,” *Vox Media*, February 14, 2017.
- 4 A. Phillip and K. Snell, “Trump to propose 10 percent spike in defense spending, major cuts to other agencies,” *The Washington Post*, February 27, 2017.
- 5 Ibid.; M. Bearak and L. Gamio, “The U.S. foreign aid budget, visualized,” *The Washington Post*, October 18, 2016.
- 6 “Israel,” *The World Factbook 2016-17*.
- 7 M. Zeitoun, *Power and Water in the Middle East: The Hidden Politics of the Palestinian-Israeli Water Conflict* (New York: I.B. Tauris, 2009).
- 8 E. Lazarou, “Water in the Israeli-Palestinian conflict,” *European Parliamentary Research Service*, January 2016.
- 9 J. Parks, “Equitable Apportionment and Groundwater in Israel and the West Bank,” *The New Jurist*, July 15, 2013.
- 10 J. Patel, “How 2016 Became Earth’s Hottest Year on Record,” *The New York Times*, January 18, 2017. See also “Shattered records show climate change is an emergency today, scientists warn,” *The Guardian*, June 17, 2016.
- 11 C. Mooney, “The Arctic climate threat that nobody’s even talking about yet,” *The Washington Post*, April 1, 2015. See also M. Hogenboom, “In Siberia there is a huge crater and it is getting bigger,” *BBC*, February 24, 2017.
- 12 Office of the Secretary, “Interior Department Announces Final Rule to Reduce Methane Emissions & Wasted Gas on Public, Tribal Lands,” Department of the Interior, November 15, 2016; E. Lipton, “G.O.P. Hurries to Slash Oil and Gas Rules, Ending Industries’ 8-Year Wait,” *The New York Times*, February. 4, 2017.
- 13 S. Greenwood, “Water Insecurity, Climate Change and Governance in the Arab World,” *Middle East Policy* XXI, no. 2 (Summer 2014), 140-56; P. Gleick,

- “Water, Drought, Climate Change, and Conflict in Syria,” *Water, Climate, and Society*, July 2014, pp. 331-40.
- 14 M. Milano et al., “Current state of Mediterranean water resources and future trends under climate and anthropogenic changes,” *Hydrological Science Journal*, vol. 58, no. 3 (2013), p. 498.
 - 15 M. Mason, “Climate change, securitisation and the Israeli-Palestinian conflict,” *The Geographical Journal*, December 2013, p. 298.
 - 16 S. Sorlini et al., “Appropriate Technologies for Drinking Water Treatment in Mediterranean Countries,” *Environmental Engineering and Management Journal*, July 2015, pp. 1721-33.
 - 17 N. Shpigel and Z. Rinat, “Water shortage in northern Israel is worst in past 100 years, new data shows,” *Haaretz*, June 27, 2016.
 - 18 Lazarou, “Water in the Israeli-Palestinian conflict,” p. 4.
 - 19 Y. Tsur, “Closing the (widening) gap between natural water resources and water needs in the Jordan River Basin: a long-term perspective,” *Water Policy*, 17 (2015), p. 547.
 - 20 R. Aviram et al., “Desalination as a game-changer in transboundary hydro-politics,” *Water Policy*, 16 (2014), pp. 609-24.
 - 21 D. Katz, “Undermining Demand Management with Supply Management: Moral Hazard in Israeli Water Policies,” *Water*, 8, no. 159 (2016), p. 10.
 - 22 Y. Shevah. “Water scarcity, water reuse, and environmental safety,” *Pure Applied Chemistry* 86, no. 7 (2014), pp. 1205-14. See also V. Gude. “Desalination and sustainability - An appraisal and current perspective,” *Water Research*, February 1, 2016, pp. 87-106.
 - 23 M. Gilmont, “Decoupling dependence on natural water: reflexivity in the regulation and allocation of water in Israel.” *Water Policy*, 16, Issue 1 (2014), pp. 79-101.
 - 24 G. Bahgat, “Alternative energy in Israel: opportunities and risks,” *Israel Affairs*, vol. 20, no. 1 (2014), pp. 11-13.
 - 25 B. Whilden, “Navigating the Conflict Over Natural Gas Reserves in the Levant Basin of the Mediterranean Sea,” *North Carolina Journal of International Law & Commercial Regulation XXXIX* (2014), p. 944; A. Liel and A. Mor, “Israeli Gas Exports as a Vehicle for Enhancing Regional Cooperation,” *Palestine-Israel Journal*, 19/20, issue 4/1 (2014), p. 20.

- 26 Bahgat, "Alternative energy in Israel," p. 4.
- 27 "Greece, Italy, Israel and Cyprus back natgas pipeline to Europe," *Reuters*, December 5, 2017.
- 28 Whilden, "Navigating the Conflict," p. 928.
- 29 S. Scheer, "Israel's Netanyahu defends gas deal in rare Supreme Court visit," *Reuters*, February 14, 2016. See also A. Rabinovitch, "Israeli court blocks government's natural gas plan in blow to energy firms," *Reuters*, March 27, 2016; B. Shaffer, "Israel – New natural gas producer in the Mediterranean," *Energy Policy*, September 2011, pp. 5379-87.
- 30 P. Sherwell, "BP Oil Disaster: How a Deadly Methane Bubble Triggered Explosion," *The Telegraph*, May 8, 2010.
- 31 S. Al Makek and A. Mohamed, "Environmental impact assessment of off shore oil spill on desalination plant," *Desalination* 185 (2005), p. 10 (emphasis added).
- 32 *Ibid.*, pp. 21-22.
- 33 P. Russell, "Israel," *Oil Shales of the World, Their Origin, Occurrence & Exploitation* (New York: Pergamon, 1990), p. 281.
- 34 For a graphic illustration of Israel's oil shale basins see P. Cizek, "Oil Shale Basins in Israel and Jordan," *Cizek Environmental Services*, November 2011.
- 35 P. Alster, "Potentially game-changing oil reserves discovered in Israel," *Fox News*, October 8, 2015.
- 36 B. Stephens, "Could Israel Become an Energy Giant? The Jewish state has 250 billion barrels of oil shale," *The Wall Street Journal*, April 5, 2011.
- 37 S. Gamper-Rabindran, "Information Collection, Access, and Dissemination to Support Evidence-Based Shale Gas Policies," *Energy Technol* 2 (2014), p. 978. See also D. Twomey et al., "Fracking: Blasting the Bedrock of Business," *Journal of Competitiveness Studies*, vol. 24, no. 3 (2016), pp. 107-27.
- 38 S. Stacy et al., "Perinatal Outcomes and Unconventional Natural Gas Operations in Southwest Pennsylvania," *Plos One*, June 3, 2015, pp. 1-3.

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