



## Update on Khushab Plutonium Production Reactor Construction Projects in Pakistan

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ISIS has obtained commercial satellite imagery from DigitalGlobe taken January 30, 2009 of the Khushab plutonium production reactors in Pakistan. The imagery shows that major construction of the buildings associated with the second Khushab reactor is likely finished and that the roof beams are being placed on top of the third Khushab reactor hall (figure 1). The operational status of the second reactor is unknown, but it could start in the near future.

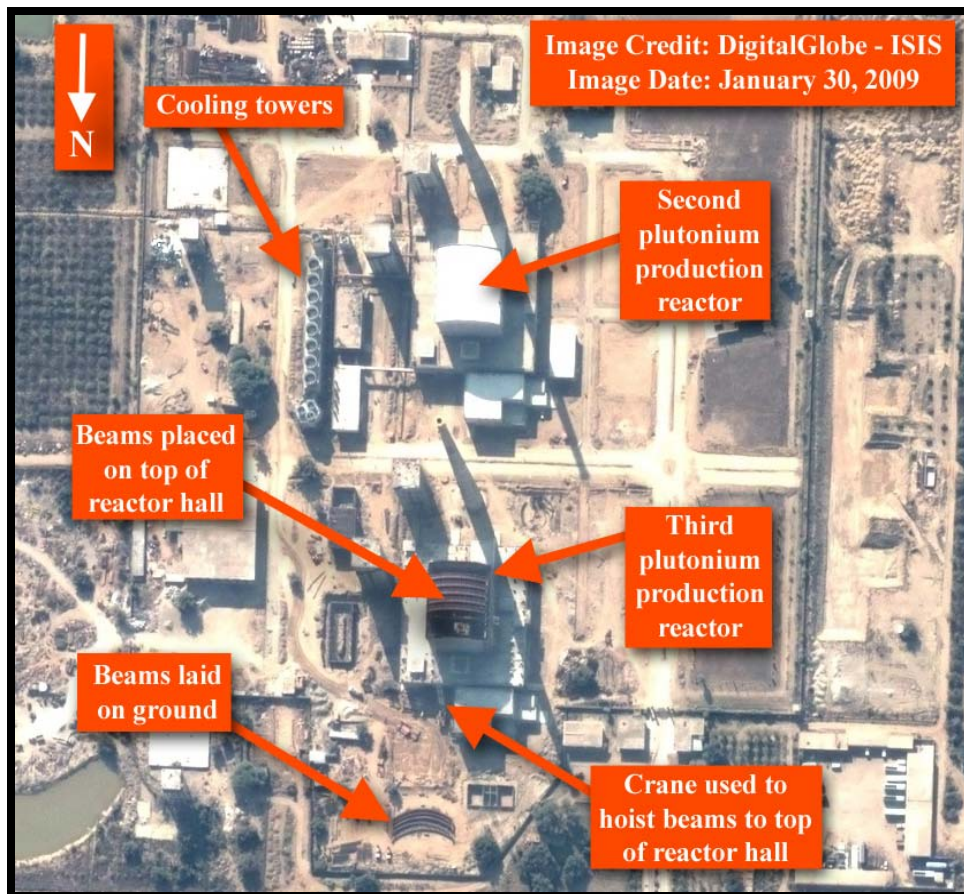


Figure 1. January 30, 2009 DigitalGlobe imagery of the second and third plutonium production reactors at Khushab, Pakistan.

[Banner image credit: DigitalGlobe-ISIS]

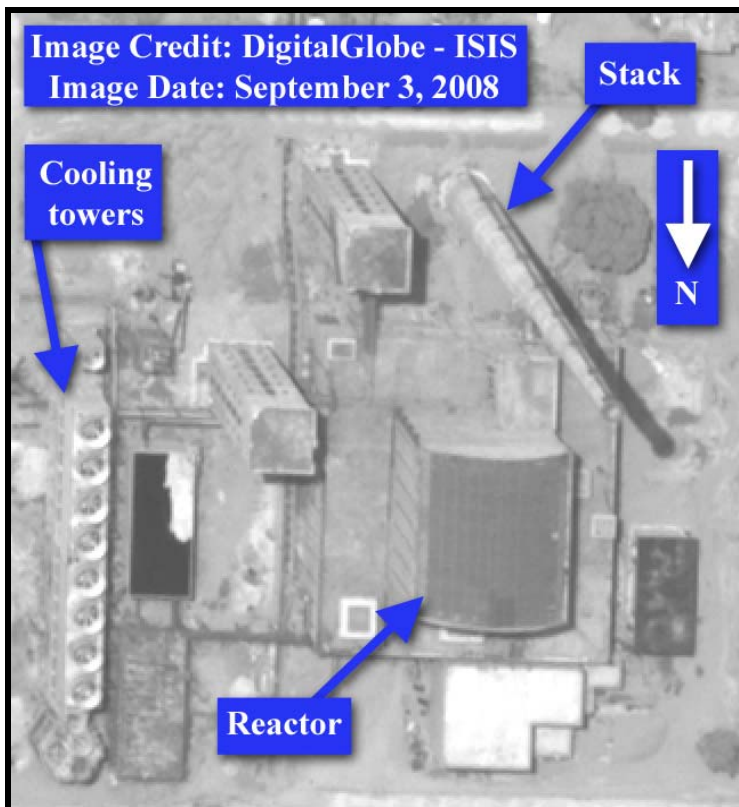
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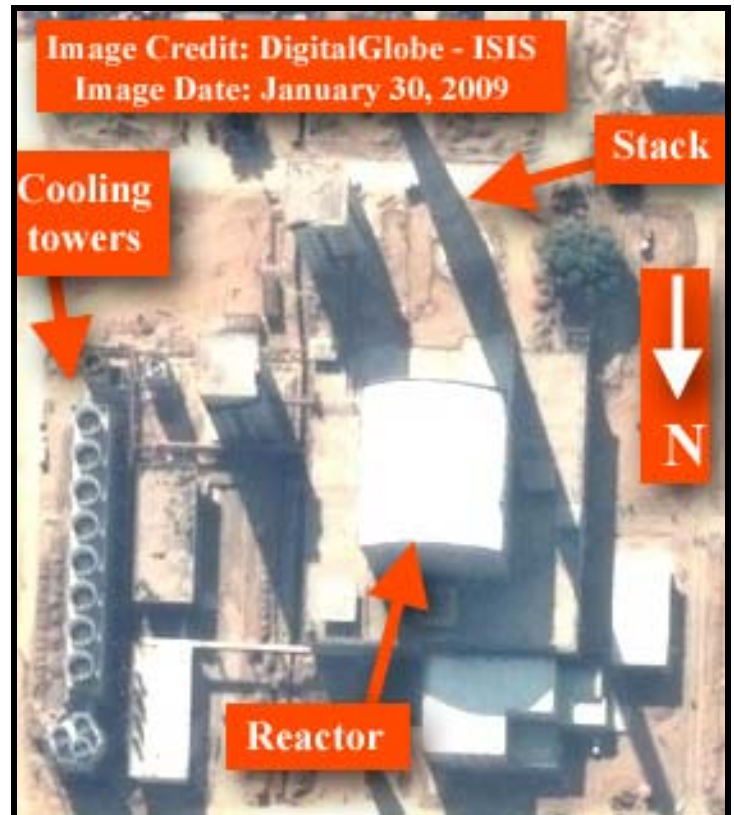
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Pakistan originally began operating [one plutonium production reactor at the Khushab nuclear site in April of 1998](#).<sup>1</sup> Construction of the [second reactor](#) began sometime after March of 2000.<sup>2</sup> Commercial satellite imagery from August 2006 showed Pakistan clearing a footprint in preparation for construction of the [third heavy water reactor](#).<sup>3</sup>

A comparison of commercial imagery of the second Khushab reactor from September 3, 2008 and January 30, 2009, shows that in the span of almost four months, there have been few changes to the structures and that there does not appear to be ongoing construction of any additional buildings (figures 2 and 3). This indicates that major construction of the buildings associated with the second Khushab reactor may have been completed.



**Figure 2. September 3, 2008 DigitalGlobe image of the second plutonium production reactor at Khushab in Pakistan.**



**Figure 3. January 30, 2009 DigitalGlobe image of the second plutonium production reactor at Khushab in Pakistan. Few changes to the buildings; there does not appear to be any new buildings under construction.**

<sup>1</sup> Analysis of IKONOS Imagery of the Plutonium Production Reactor at Khushab, Pakistan; Institute for Science and International Security (ISIS), March 16, 2000:

<http://isis-online.org/publications/southasia/ikonoskhushabreactor.html>

<sup>2</sup> Commercial Satellite Imagery Suggests Pakistan is Building a Second, Much Larger Plutonium Production Reactor: Is South Asia Heading for a Dramatic Buildup in Nuclear Arsenals?; David Albright and Paul Brannan, Institute for Science and International Security (ISIS), July 24, 2006,;

<http://isis-online.org/publications/southasia/newkhushab.pdf>

<sup>3</sup> Pakistan Appears to be Building a Third Plutonium Production Reactor at Khushab Nuclear Site; David Albright and Paul Brannan, Institute for Science and International Security (ISIS), June 21, 2007:

<http://www.isis-online.org/publications/southasia/ThirdKhushabReactor.pdf>

The most recent imagery shows the construction of defined roads and lane dividers on the compound near the second Khushab reactor, whereas the September 3, 2008 imagery shows only dirt tracks made by vehicles (figures 4 and 5). While it is unclear whether these roads are paved in the new imagery, they are well-defined and paving would be likely to follow soon. Such preparation indicates that construction crews do not anticipate using most types of heavy construction equipment on or around the second reactor and its associated buildings.

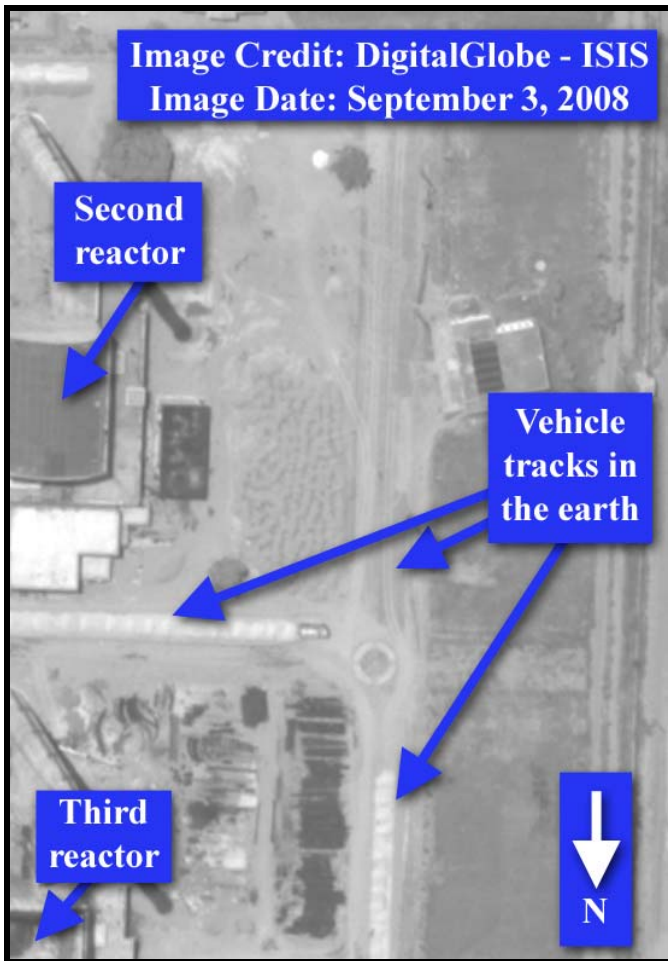


Figure 4. September 3, 2008 DigitalGlobe image of vehicle tracks on the terrain near the two reactors.

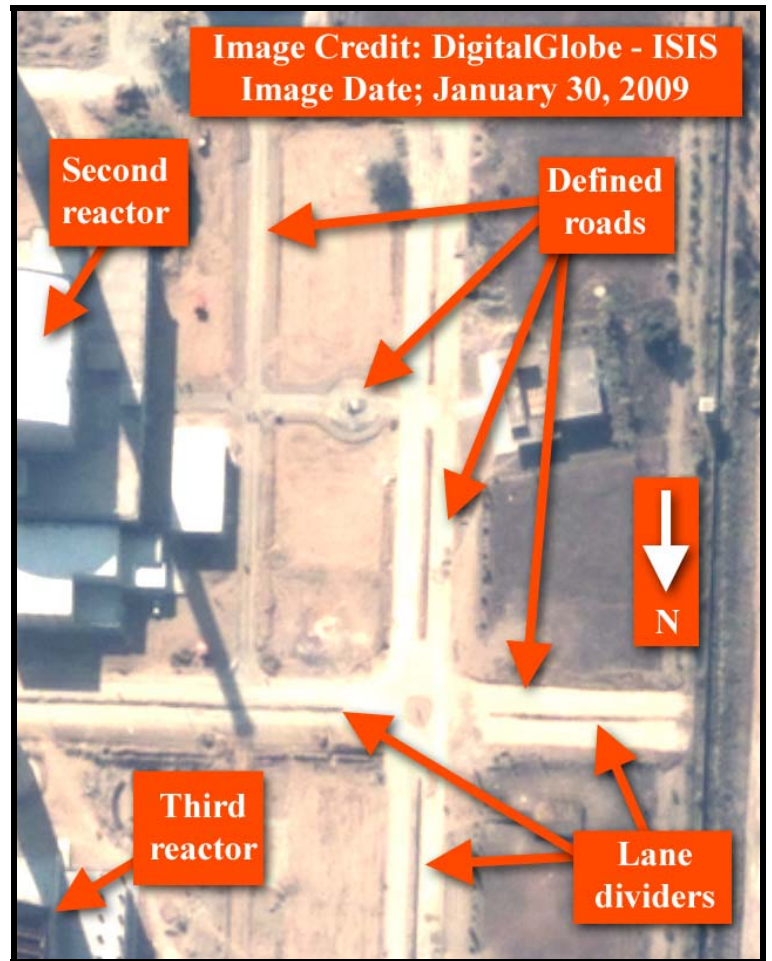
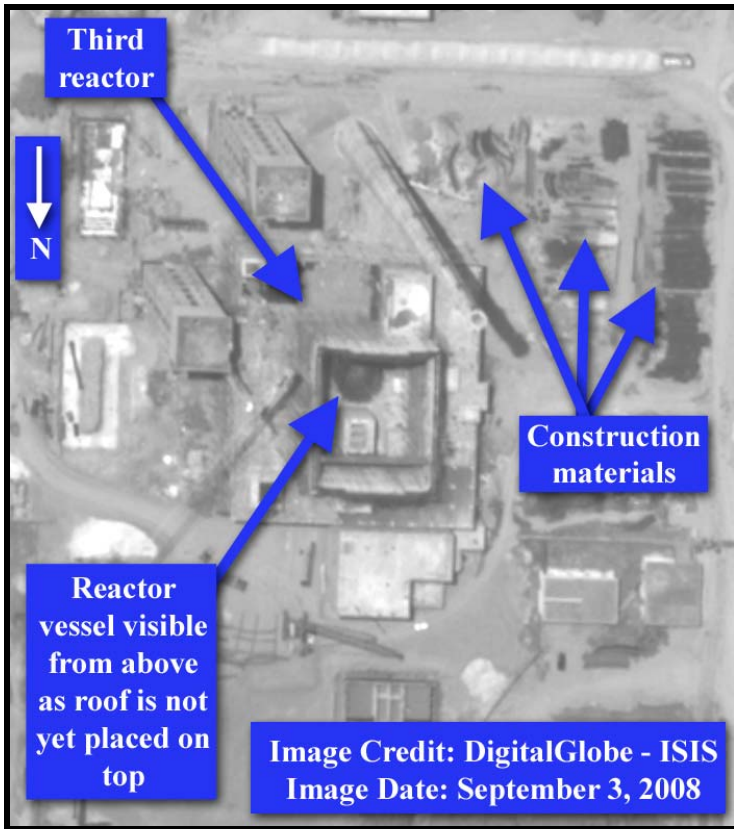
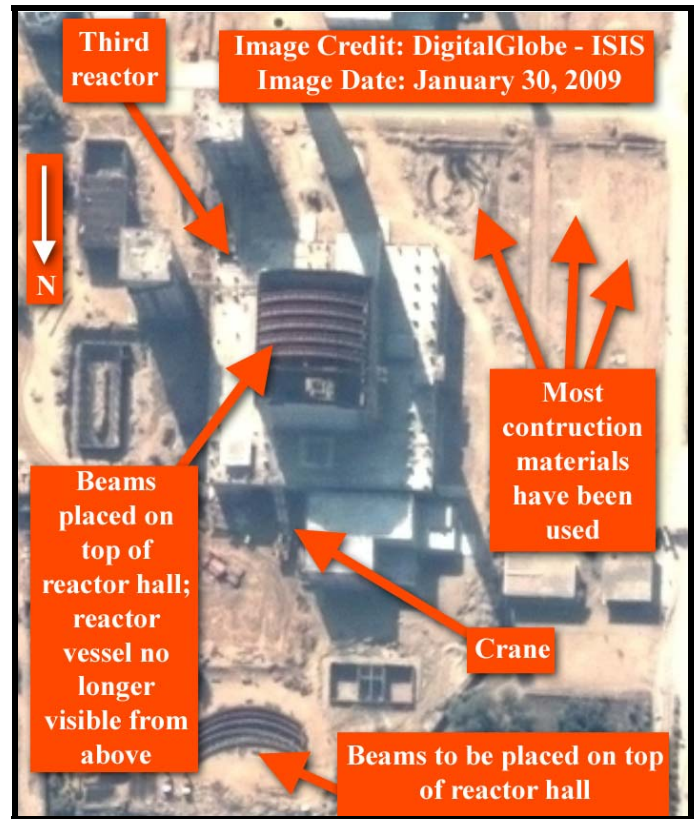


Figure 5. January 30, 2009 DigitalGlobe image showing the same area with defined roads and lane dividers. It is not clear if the roads are paved; if not, they will likely be paved soon.

[DigitalGlobe imagery from September 3, 2008](#) showed the reactor cylinder inside the third reactor building because the roof had not yet been placed on top.<sup>4</sup> Imagery from January 30, 2009 shows that the roof beams are being placed on top of the reactor hall and the reactor cylinder is no longer visible (figures 6 and 7).



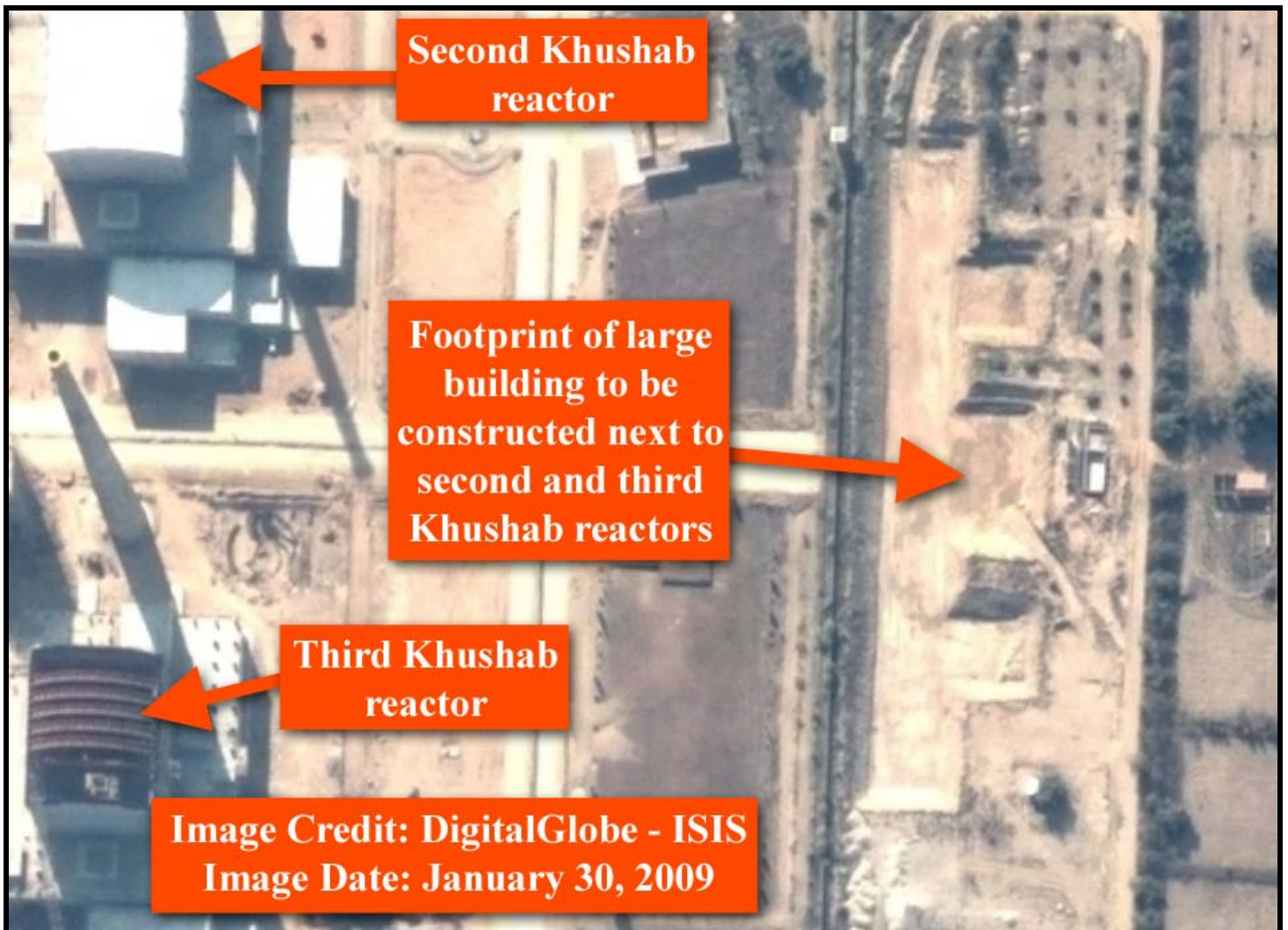
**Figure 6. September 3, 2008**  
**DigitalGlobe image showing the third reactor at Khushab. The reactor vessel can be seen from above; piles of construction materials can be seen adjacent to the reactor building in the upper right corner.**



**Figure 7. January 30, 2009 DigitalGlobe image showing the third reactor at Khushab. Roof beams have been placed on top of the reactor hall and the reactor vessel is no longer visible. Roof beams are on the ground next to the reactor building, ready to be hoisted into place by the crane. Most construction materials seen in the upper right corner of the September 3, 2008 image have been used.**

<sup>4</sup> Second Khushab Plutonium Production Reactor Nears Completion: Time to reenergize negotiations for a Verified Fissile Material Cutoff Treaty; David Albright and Paul Brannan, Institute for Science and International Security (ISIS), September 18, 2008: [http://www.isis-online.org/publications/southasia/Khushab\\_18September2008.pdf](http://www.isis-online.org/publications/southasia/Khushab_18September2008.pdf)

Also in the January 30, 2009 imagery is a footprint for a large building adjacent to both the second and third Khushab reactors (figure 8). The arrangement of the footprint, and its location outside the main perimeter fence, indicates it will be a large administrative building with multiple wings, though the basement for this building appears unusually deep.



**Figure 8. Image from January 30, 2009 shows the footprint for what will likely be a large administrative building, though the basement for this building appears unusually deep.**

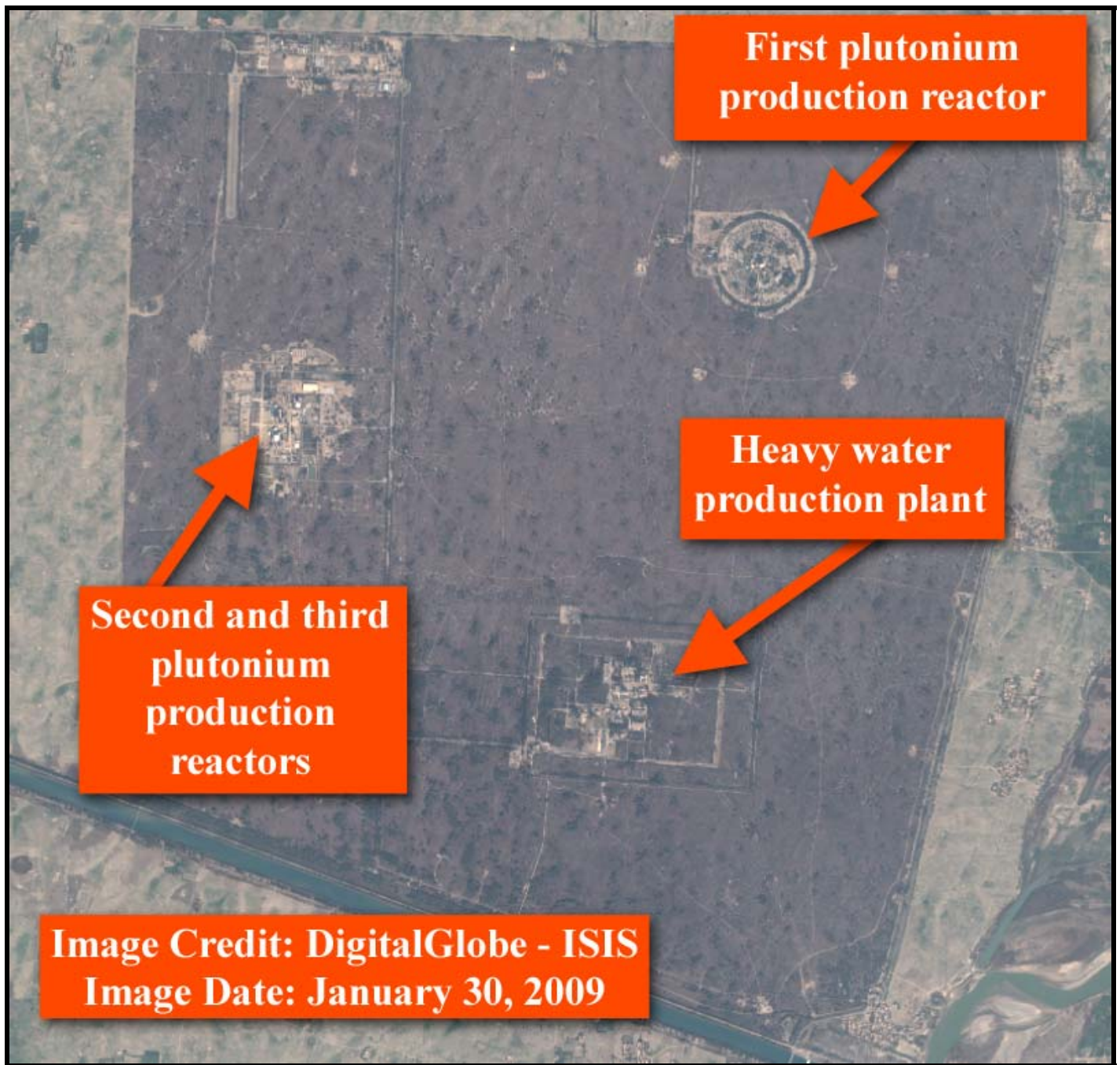


Figure 9. Overview of the Khushab nuclear site.

## **Conclusion**

Pakistan's increase in plutonium production capability stands to accelerate an arms race with India. In the current climate, with Pakistan's leadership under duress from daily acts of violence by insurgent Taliban forces and organized political opposition, the security of any nuclear material produced in these reactors is in question.

India can easily match Pakistan's actions, given its own capabilities to produce plutonium for weapons in heavy water power reactors and a breeder reactor currently under construction. Rather than standing by as a dangerous surge in the production of fissile materials for weapons unfolds in South Asia, the United States should make it a key priority to convince Pakistan to join the negotiations of a universal, verified, Fissile Material Cutoff Treaty (FMCT), which would ban the production of plutonium and highly enriched uranium for nuclear explosives. As an interim step, the United States should press both India and Pakistan to suspend any production of fissile material for nuclear weapons.

Current U.S. policy, focused primarily on shoring up Pakistan's resources for fighting the Taliban and al Qaeda, has had the unfortunate effect of turning the United States into more of a concerned by-stander of Pakistan's expansion of its ability to produce nuclear weapons. The Obama Administration has an opportunity to make a verified FMCT a top priority again and insist that Pakistan and its rival India join these negotiations in good faith.