

History of the Gravel Gertie

DOE's Facilities that provide Containment if there is an Accidental Chemical high Explosive Detonation during Nuclear Explosive Assembly/disassembly Operations

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Authorizatton Basis & Safety Analysis

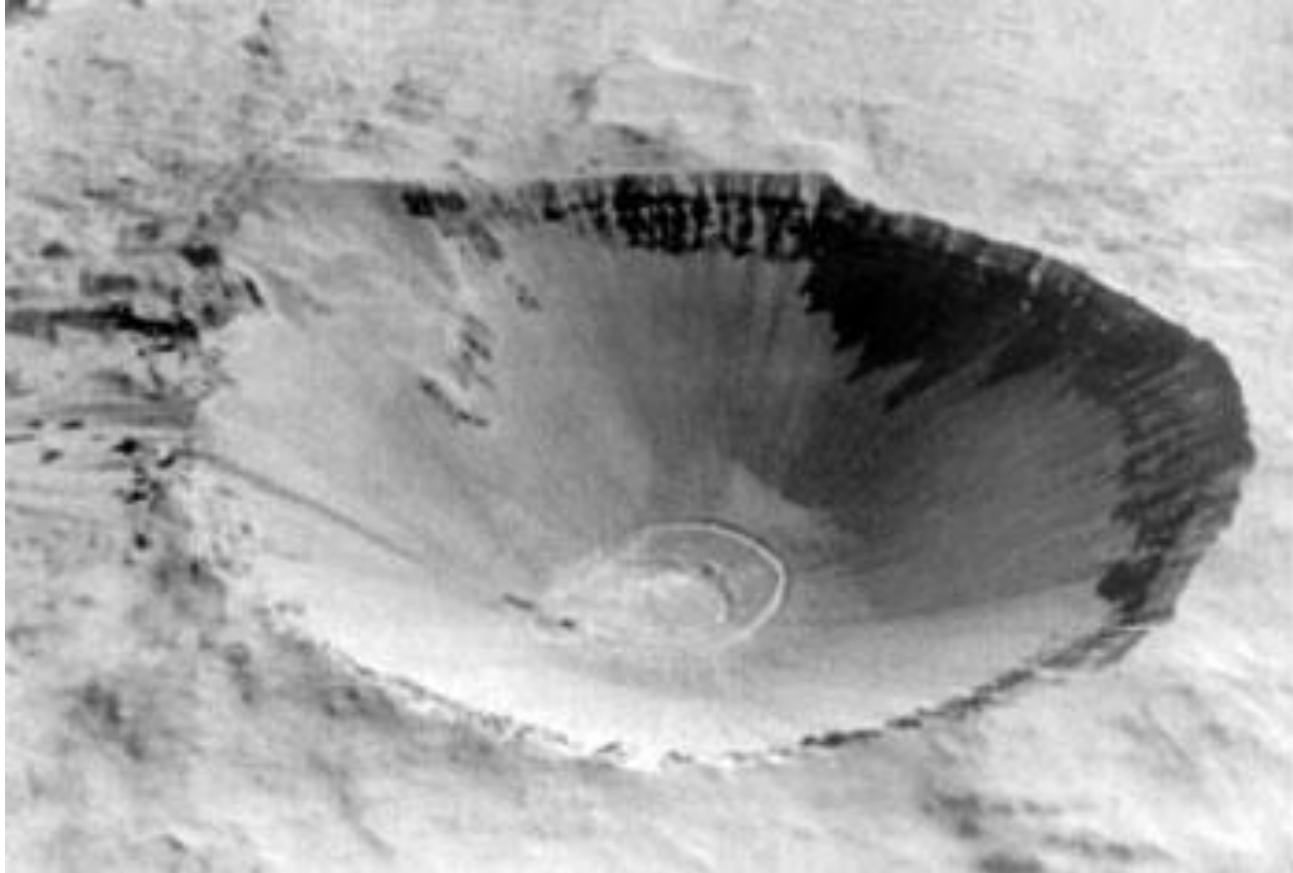


Photograph 8-25: Abandoned Gravel Gertie at the Clarksville Base. Indigenous vegetation now grows uncontrolled on the characteristic sloping roof and behind the lower retaining wall of this Cold War nuclear weapons modification plant.

Courtesy of John J. O'Brien, Official Historian at Fort Campbell, Kentucky.

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Sedan Crater at NTS, 1962



From <http://www.knpb.org/productions/historicnevada/sedan.asp>
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Pantex Plant, NE of Amarillo, Texas



Moisture Barrier Membrane



Gravel Gertie Design Basis

- Release internal pressure from a 423# HE detonation.
- Filter plutonium aerosol particles using a fluidized bed for pressure release to minimize off-site doses to the public.
- Maintain integrity so that all pressure release occurs through the gravel filter.
- Protect adjacent facilities from blast effects
- Protect internal spaces from effects of a detonation within adjacent facilities.
- Allow performance of nuclear explosive work.

Exiting Fireball from 1956 Test without Door



Second Debris Puff due to Gravel Fall-back Expelling Air



Maximum Gravel Lift from a Full-scale Detonation



Gravel Fall-back Dust Plume



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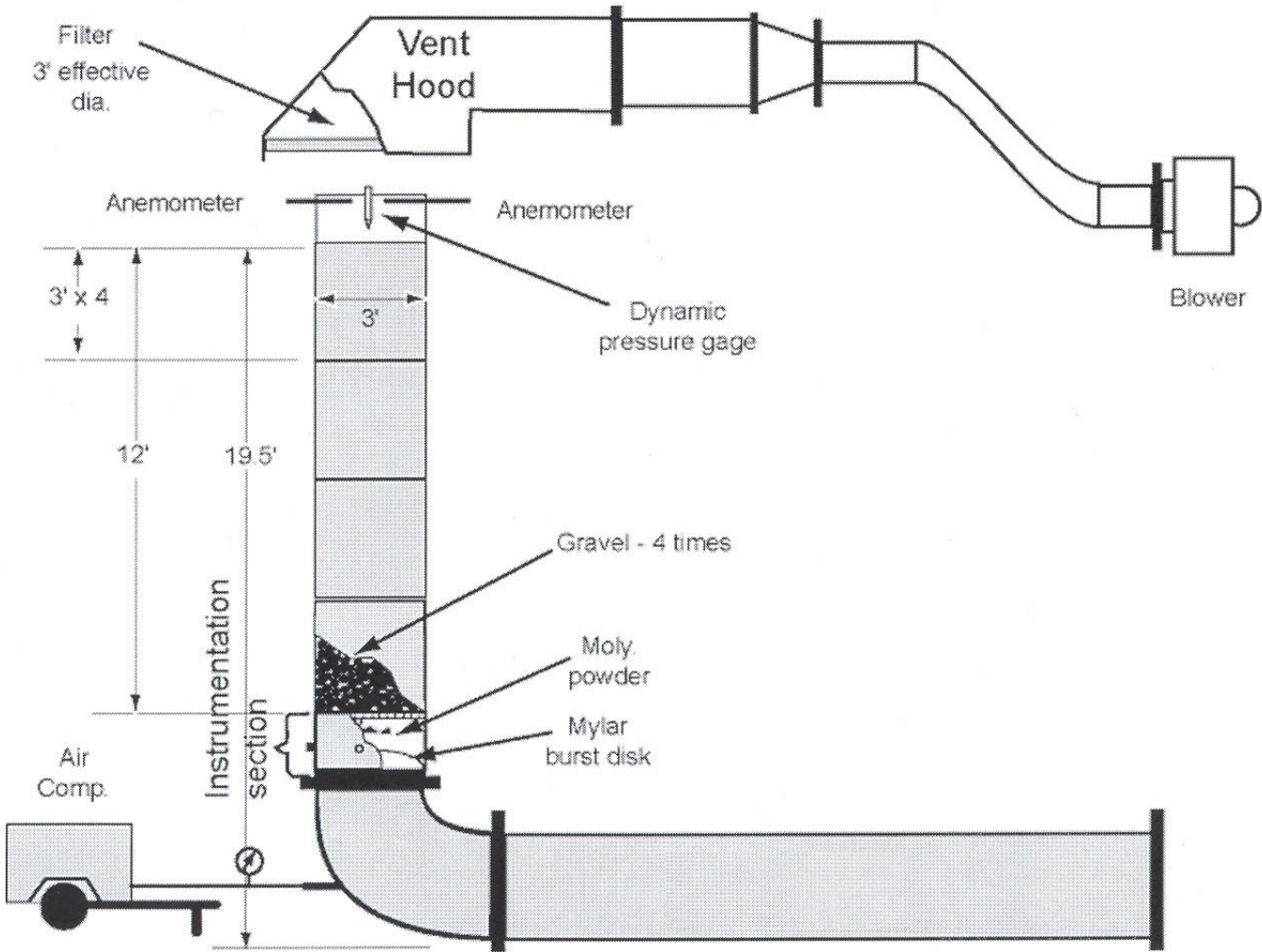
Conditions less than One Minute after the Detonation



The SwRI Gravel Test Setup



Schematic of SwRI Test Setup



Future Cell Construction

- Delete moisture barrier layer since 12-44 experience shows is unnecessary.
- Change personnel airlock, probably deleting rotating door.
- Install HEPA filtered exhausts for geomembrane covering.
- Consider going to a total-containment design.
- Perform another test that records flow measurements and particulate loadings.