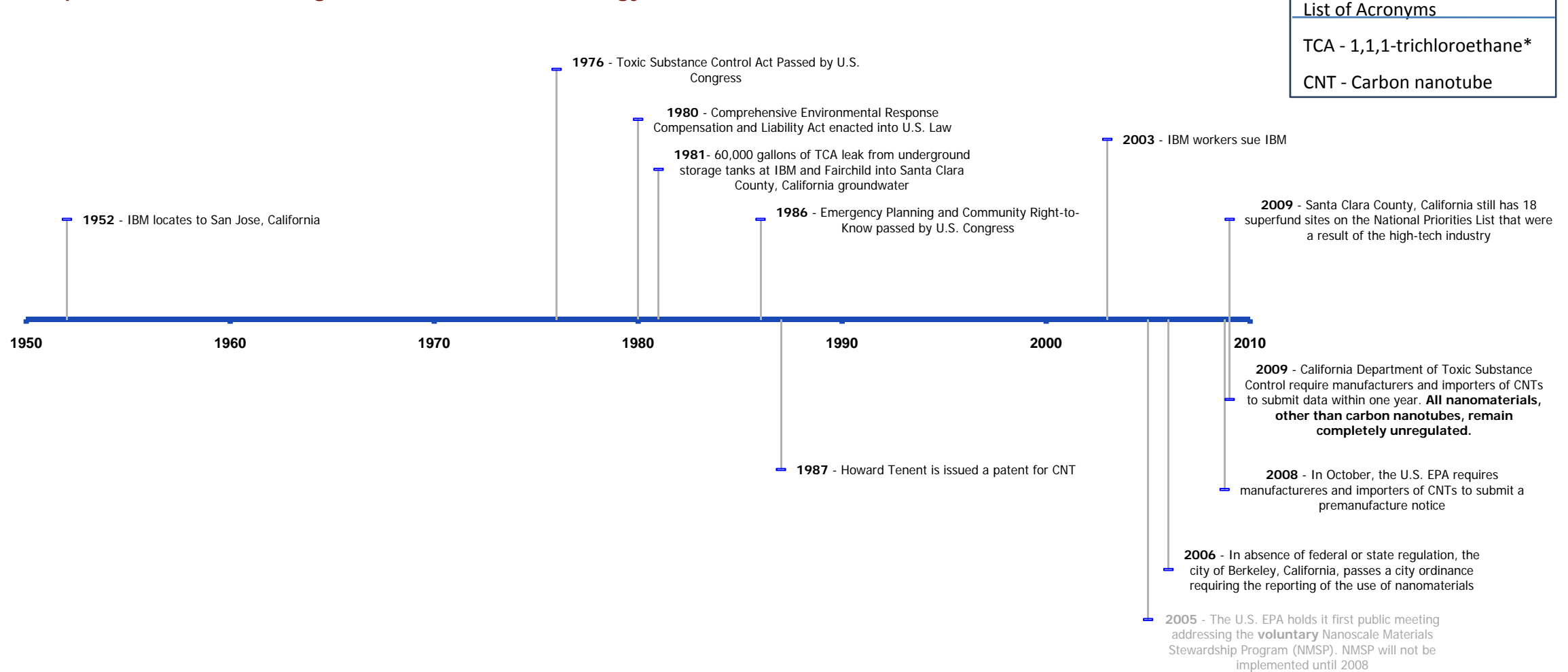


In the 1950s the high-tech industry began to emerge in the Silicon Valley under the guise of “clean tech.” Despite the lack of smoke stacks and other obvious signs of pollution, the semiconductor industry was contaminating the groundwater and soil of Silicon Valley. Thousands of gallons of toxic chemicals leaked from underground storage tanks and into the surrounding groundwater. Although these chemicals were handled in a way thought to be safe, the lack of sufficient environmental, health and safety research mixed with insufficient regulation proved to be detrimental to the safety of the surrounding communities. A new industry is emerging in the Silicon Valley. Unfortunately, nanotechnology is following the same path as the semiconductor industry. There is a lack of data, safety information and monitoring equipment to ensure that the surrounding communities will not be harmed in the future.

The timeline below illustrates the lag between an industry’s emergence and the development of safety information and regulation in the semiconductor industry and nanotechnology industry.

A comparison of the lack of regulation in the nanotechnology and semiconductor industries



List of Acronyms

- TCA - 1,1,1-trichloroethane*
- CNT - Carbon nanotube

Voluntary programs are shown in grey

* Trichloroethane (TCA) can cause dizziness and loss of coordination. Exposure to high levels may cause unconsciousness, decreased blood pressure, and the heart to stop beating.

1952 – IBM locates to San Jose, California

1976 – Toxic Substances Control Act passed by U.S. Congress. Chemicals in use were “grandfathered” in – chemical suppliers to electronic manufacturers were not required to collect or share data on chemicals already in use.

1980 – Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund Law) enacted into U.S. federal law. CERCLA “created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over five years, \$1.6 billion was collected and the tax went to a trust fund for cleaning up

1981 – IBM and Fairchild Camera and Instrument report toxics spills. 60,000 gallons of trichloroethane* (TCA) spill from underground storage tanks and contaminate wells in Santa Clara County, California. Environmental agencies discover that 80 percent of all tanks in Santa Clara county were leaking.

1983– SVTC and other groups campaign to get Emergency Planning and Community Right-to-Know passed by U.S Congress.

1986 – Emergency Planning and Community Right-to-Know Act (EPCRA) enacted. EPCRA requires facilities to report toxic chemical emissions and report information on chemicals used.

1987 – Howard G. Tennent is issued a patent by the U.S. Patent and Trademark Office for what can be considered a carbon nanotube. The patent was for “an essentially cylindrical discrete carbon fibril characterized by a substantially constant diameter between about 3.5 and about 70 nanometers, e.g. between about 7 and 25 nanometers”

2003- Former IBM workers with cancer sue IBM and use Corporate mortality files which recorded the deaths of 31,961 IBM employees from 1969-2001. Worker eventually won the right to use Corporate Mortality File data but lost their case.

2005 – The Federal Environmental Protection Agency (U.S. EPA) holds its first public meeting to explore the feasibility of a Nanoscale Materials Stewardship Program (NMSP). The Nanoscale Materials Stewardship Program is a completely voluntary program. Companies that choose to participate can report some or all of the following information about the nanomaterials manufactured or imported: physical and chemical properties, hazards associated with the material, use, and risk management practices or plans. The NMSP will not be implemented until 2008.

2006 – In absence of federal or state regulation, the city of Berkeley, California, passes a city ordinance requiring “[a]ll facilities that manufacture or use manufactured nanoparticles ... submit a separate written disclosure of the current toxicology, to the extent known, and how the facility will safely handle, monitor, contain, dispose, track inventory, prevent release and mitigate such materials.”

2009 – Santa Clara County, California still has 18 superfund sites on the National Priorities list that were a result of the high-tech industry. The California Department of Toxic Substance Control requires manufacturers and importers of CNTs to submit data on CNTs within one year. **All nanomaterials, other than CNTs, remain completely unregulated.**

* Trichloroethane (TCA) is used to clean microscopic dirt and dust off of chips. It can cause dizziness and loss of coordination. Exposure to high levels may cause unconsciousness, decreased blood pressure, and the heart to stop beating