



## **Health on the Homefront: Impact of Contaminated Water at Camp Lejeune on Virginia's Veterans**



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#### **General Information**

- Marine Corps Base Camp Lejeune Onslow County, NC, est. 1940, 233 sq. miles. Housing capabilities: 54,000 individuals including 11,000 dependents and Civilians. Families typically live in base housing 2-3 years.
- At the time the contamination was discovered 1980-1982, 8 water systems, 100 wells were in use. Tarawa Terrace, Hadnot Point, Holcomb Boulevard and the Rifle Range.
- Federal Water Pollution Control Act, 1948; Revised to its current shape "Clean Water Act" 1972. EPA water testing parameters instituted by the Navy in 1980, testing for Trihalomethanes (TTHM) a by product of the water treatment process.
- In 1980 there were no enforceable EPA regulations for maximum levels of TCE & PCE or testing requirements. There were suggested "no adverse reaction" levels for TCE in 1979 and PCE in 1980. Max safe levels were set for TCE in 1989 and PCE in 1992.



### Health on the Homefront: Impact of Contaminated Water at Camp Lejeune on Virginia's Veterans

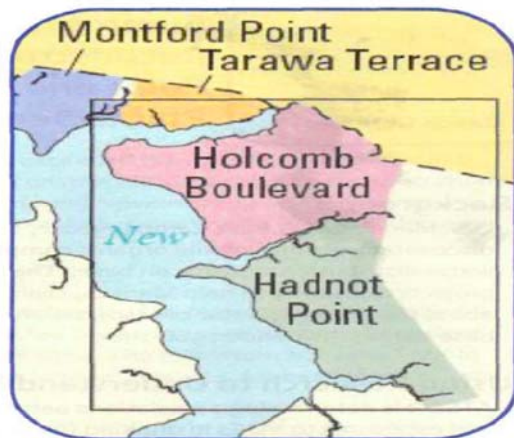


Figure 1. Location of U.S. Marine Corps Base, Camp Lejeune, North Carolina.

Agency for Toxic Substances and Disease Registry (2005). Report of the Camp Lejeune Water-Modeling Expert Panel, Prepared by: Eastern Research Group, Inc.



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U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Camp Lejeune Chapter A Report, Summary and Findings: Analysis and Reconstruction of Drinking Water in the Hadnot Point and Holcomb Boulevard Water Treatment Plant Services Area, Pg. 2.



**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

### Toxicology and Possible Health Effects

1. Trichloroethylene (TCE): **Toxic** and **Carcinogenic**
2. Tetrachloroethylene (PCE) also known as Perchloroethylene: **Toxic** and **Carcinogenic**
3. Trans-1,2-dichloroethylene (DCE): **Toxic**, metabolite DCA **Carcinogenic**
4. Benzene: **Toxic** and **Carcinogenic**



**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

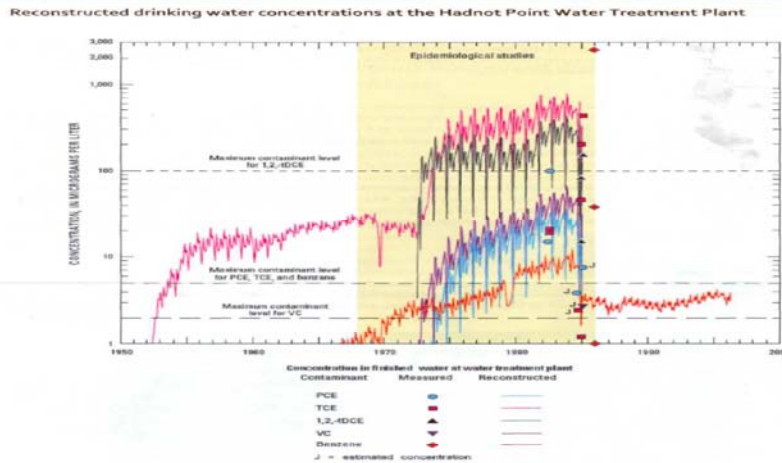
### Other Volatile Organic Chemicals of Concern

1. Vinyl Chloride: **Carcinogenic**
  2. Methylene Chloride: **Carcinogenic**
  3. Toulene: **Toxic**
- Many of these VOC's lack sufficient study and their effects on the human body are poorly understood. In addition the **synergistic** effects of these chemicals are totally unknown. To date, the ATSDR has no plan for studying the **teratogenic** effects of the VOC's that Veterans, their dependents, and the civilian workforce were exposed.
  - Anyone working, living, or conceived at the Camp Lejeune Base could be at risk for adverse health effects. The law covers those who spent 30 days or more on the base from 1957 to 1987. However, the water modeling from Hadnot Point pushes the date back to 1953.



**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

Contamination Levels Over Time



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**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
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**“Honoring America’s Veterans and Caring for Camp  
Lejeune Families Act of 2012”**

Conditions  
Covered:

- |                           |                         |
|---------------------------|-------------------------|
| Esophageal cancer         | Renal toxicity          |
| Lung cancer               | Hepatic steatosis       |
| Breast cancer             | Female infertility      |
| Bladder cancer            | Miscarriage             |
| Kidney cancer             | Scleroderma             |
| Leukemia                  | Neurobehavioral effects |
| Multiple myeloma          | Non-Hodgkin’s lymphoma  |
| Myleodysplastic syndromes |                         |

H.R. 1627--112th Congress: Honoring America's Veterans and Caring for Camp Lejeune Families Act of 2012. (2011). In GovTrack.us (database of federal legislation). Retrieved October 24, 2012, from <http://www.govtrack.us/congress/bills/112/hr1627>.



**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

**Number of Virginia Veterans**

**Number of Veterans in Virginia (2007):** 823,056

**Men:** 754,742

**Women:** 68,314

**Table #1: Virginia Veterans by Sex and Branch of Service**

	<b>Men</b>	<b>Women</b>
<b>Marines</b>	<b>75,474</b>	<b>5,260</b>
<b>Navy</b>	<b>6,287</b>	<b>550</b>
<b>Total</b>	<b>81,761</b>	<b>5,810</b>

**Total: 87,571** Virginia veterans possibly affected by the contamination at Camp Lejeune. Percentage of Virginia veterans: **10.6%**

- These levels only reflect the number of veterans it does not include the dependents that may have been affected.



**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

**A Public Health Approach regarding Virginians Exposed to  
Contaminated Water at Camp Lejeune**

**Policy Development:**

- Adoption of an action plan to educate Virginians and health care providers about the potential health effects of exposure to contaminated water at Camp Lejeune.
- Periodic review of relevant data and updating of intervention strategies.



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Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

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**Assurance:**

- Implementation of a statewide educational program aimed at the veteran community.
- Implementation of a statewide educational program aimed at health care providers.



**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

**Proposed Actions**

1. Post information regarding the contamination on public websites with links to additional information.
2. Use existing public social media resources like Twitter, Facebook, LinkedIn, etc. to distribute the information to the veteran community.
3. Provide a briefing of this information to the Veterans Services Organizations and request that they share the information with their members.
4. Issue press releases/public service announcements initially and periodically as new information is obtained about the contamination.
5. Use billboards along Virginia's most heavily traveled highways (i.e. I-95, I-64, Rt. 29) to alert the public about this issue.



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Impact of Contaminated  
Water at Camp Lejeune on  
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**A Public Health Approach regarding Virginians Exposed to  
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**Monitor:**

- Continuous monitoring of actions taken by Congress and federal agencies, the Community Assistance Panel (CAP) at Camp Lejeune, and other related organizations.
- Continuous monitoring of relevant data from Cancer and Disease Registries and other sources of health data.




**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

**Proposed Assessments**

**Overall success could be measured by:**


- 1.Number of Virginia Veterans Registered with the Camp Lejeune Contaminated Water Registry.
- 2.Number of “Hits” and “posts” on the various social media outlets: public websites, Facebook Pages, and Twitter Accounts.
- 3.Number of respondents to the phone numbers and websites set up for the Press Release/Public Service Announcements.



**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

Recommended Actions by Individuals  
Exposed to Contaminated Water at MC Base Camp Lejeune 1953-1987

Groups (some people may be in more than one group)	Join Registries	See health care pro & notify re. exposure	Apply for health care from VA	Apply for VA Disability Compensation	Apply for VA reimburse- ment for health care when funds appropriated	File claim under FECA	File claim under Federal Tort Claims Act
Veterans	X	X	X	X			X
Veterans' Family Members or in utero	X	X			X		X
Civilian Employees	X	X				X	X



**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

***WHAT SHOULD I DO?***

**Step 1:** Visit the health care provider of your choice. **Veterans** registered with the VA, Contact your local VA healthcare provider. **Not registered?** Call 1-877-222-8387 to register. **Everyone: Health Survey for your doctor:** <http://drclaudiamiller.com/publications-presentations/>, download PDF free for personal use, appendix C.

**Step 2: Everyone:** Register for information and or inclusion in current or future studies: [clwater@usmc.mil](mailto:clwater@usmc.mil) and **1-877-261-9782**, M-F, 8:30 a.m. - 5 p.m., or <https://clnr.hqi.usmc.mil/> Or call Marine Corps Call Center staff at **1-877-261-9782**, M-F, 8:30 a.m. - 5 p.m.





**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

**WHAT SHOULD I DO?**

**Step 3: Filing a Claim: Service members and dependents:** Request your health records. National Personnel Records Center, Military Personnel Records, 9700 Page Avenue, St. Louis, MO 63132-5100, or

[www.archives.gov/facilities/mo/st\\_louis/military\\_personnel\\_records.html](http://www.archives.gov/facilities/mo/st_louis/military_personnel_records.html)

**Claims and Compensation for Military Veterans and Family members:**

Questions: Navy JAG at 202-685-4600, or <http://www.publichealth.va.gov/exposures/camp-lejeune/>. **Filing a Claim: "Claims for personal injury/death as a result of exposure to contaminated drinking water at Camp Lejeune":**

[http://www.jag.navy.mil/organization/code\\_15\\_packets\\_forms.htm](http://www.jag.navy.mil/organization/code_15_packets_forms.htm).

Questions contact the Navy JAG office, Personnel Claims Unit at: (888) 897-8217, commercial (757) 440-6315, or DSN 564-3310. **Federal Civilian employees** should: contact your doctor for health records then go to:

<http://www.dol.gov/owcp/dfec/regs/compliance/camplejeuneguidance.htm> or call 1-866-487-2365. Additional information can be received by writing to: U.S. Dept. of Labor, OWCP, DFEC, Charles E. Bennett Federal Building, 400 West Bay Street, Room 826, Jacksonville, FL 32202, (904) 366-0100, Fax: (904) 366-0101.



**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

**WHAT SHOULD I DO?**

**Step 4: Educate Yourself!** The Marine Corps website:

<https://clnr.hqi.usmc.mil/>, Agency for Toxic Substances and Disease Registry:

[http://www.atsdr.cdc.gov/sites/lejeune/faq\\_general.html](http://www.atsdr.cdc.gov/sites/lejeune/faq_general.html). Civilian websites:

**Toxic Homefront Empowered Survivors Take All Necessary Defense (The Stand):** <http://www.watersurvivors.com/default.asp>. **The Few, The Proud,**

**The Forgotten:** <http://www.tftptf.com/>. **Community Assistance Panel**

**(CAP):** allows affected community members to voice their concerns regarding themselves and their families. Meetings are broadcast live on streaming video: <http://www.atsdr.cdc.gov/sites/lejeune/index.html> transcripts are also available. CAP meetings are open to the public, any interested person can register to attend and sit in the audience. Dates and times of the CAP meetings: <http://www.atsdr.cdc.gov/sites/lejeune/> click on the "Calendar of Events" link.



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Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

**ATSDR Health Studies for Camp Lejeune Expected to be  
Released in 2013 and 2014**

- **Birth Defects and Childhood Cancer Study**—Looks at whether children born from 1968-1985 to mothers who were exposed to contaminated drinking water at Camp Lejeune have increased risk for specific birth defects and childhood cancers.
- **Health Survey of Marine Corps Personnel and Civilians**—Will help determine whether contaminated water may have affected people's health and provide more information about how environmental and chemical exposures affect human health.
- **Male Breast Cancer Study**—Will look at cases of male breast cancer among Marines to determine whether a link exists between cases and exposure to contaminated drinking water at Camp Lejeune.
- **Mortality Study**—Looks at all causes of death to determine if there is a link between specific causes of death and exposure to contaminated drinking water at Camp Lejeune.

U. S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Camp Lejeune Chapter A Report, Summary and Findings: Analysis and Reconstruction of Drinking Water in the Hadnot Point and Holcomb Boulevard Water Treatment Plant Services Area, Pg.4 .



**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

**UPDATE 2013 NEWLY RELEASED STUDY**

**Evaluation of exposure to contaminated drinking water and specific birth defects and childhood cancers at Marine Corps Base Camp Lejeune, North Carolina: a case—control study.**

- An association between the contaminated water and children born with neural tube defects has been found.
- A weak association between the contaminated water and children who developed hematopoietic cancers (blood cancers) has been found.
- There is no current information regarding how the VA will handle these new conditions or how and when they will be added to the list of illnesses covered by H.R. 1627.

Agency of Toxic Substances and Disease Registry, (11/ 2013). Evaluation of exposure to contaminated drinking water and specific birth defects and childhood cancers at Marine Corps Base Camp Lejeune, North Carolina: a case—control study. doi: 10.1186/1476-069X-12-104.



**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

**UPDATE 2014 NEWLY RELEASED STUDY**

**Mortality Study** Released 2014 by Bove, et. al.

- Mortality Hazard Ratio (HR) 1.10, 95% CI 1.00, 1.20.
- Strength: No. of Individuals in study and minimal loss of individuals to follow-up.
- Weaknesses: 97% under age of 55; 6% mortality; disease misclassification, lack of info. on other risk factors; poor historical records.

Bove et al.: Evaluation of mortality among Marines and Navy personnel exposed to contaminated drinking water at USMC base Camp Lejeune: a retrospective cohort study. *Environmental Health*, 2014 13:10. doi:10.1186/1476-069X-13-10.



**Health on the Homefront:  
Impact of Contaminated  
Water at Camp Lejeune on  
Virginia's Veterans**

**NEWLY RELEASED STUDY**

**Epigenetic Transgenerational Actions of Vinclozolin on Promoter Regions of the Sperm Epigenome. (2013)** (Skinner, et. al.)

- Vinclozolin – fungicide commonly used in agriculture.
- Endocrine disruptor-cancers, infertility, and obesity-transgenerational effects.

Guerrero-Bosagna, C., Settles, M., Lucker, B., Skinner, M. (09/2013). Epigenetic Transgenerational Actions of Vinclozolin on Promoter Regions of the Sperm Epigenome, *PLOS One* 5(9): e13100. doi:10.1371/journal.pone.0013100.