

Health Consultation

**Tyndall Air Force Base
Panama City, Bay County, Florida
EPA Facility ID: FL570024124**

Prepared by:

Federal Facilities Assessment Branch
Division of Health Assessment and Consultation
Agency for Toxic Substances and Disease Registry
Atlanta, Georgia

Statement of Issue

The Agency for Toxic Substances and Disease Registry (ATSDR) released a public health assessment (PHA) for Tyndall Air Force Base (TAFB) (EPA ID. FL1570024124) Panama City, Bay County, Florida on December 30, 1999 (ATSDR, 1999). The PHA concluded that Wherry Landfill was an indeterminate public health hazard because the landfill was not sampled for subsurface soil gases that if present, could potentially present an explosive hazard to nearby residents.

Landfills may be a source of carbon dioxide, carbon monoxide, methane, and volatile organic compounds. These gases could migrate through the subsurface soil to adjacent homes, build in 1959, at Bay View Housing Area via undisturbed soils or through soils in disturbed areas such as utility lines. Exposure could have occurred since the homes were built in 1959.

In ATSDR's 1999 PHA, ATSDR documented the potential for methane gas, if generated by the landfill, to migrate into Bay Housing Area creating an explosive hazard. Additionally in the PHA, ATSDR concluded that DDT in Shoal Point Bayou (Fred Bayou), lead in soils at the Tyndall Elementary school, and exposure to lead in tap water at 2451 Lincoln Dr in the Bay View housing area posed no apparent public health hazard.

This report documents ATSDR's revision of the Wherry Landfill gases from an "indeterminate" conclusion category to a no public hazard category, based on recent actions taken by the Air Force, in response to our recommendations. At the request of the USAF, ATSDR reviewed the USAF Remedial Investigation Activities Report for Sites LF001, LF003, and SS014 to determine if our 1999 recommendations were addressed.

Background

TAFB is an active United States Air Force Base located in Bay County, Florida, approximately 1 mile southeast of Panama City. The base covers about 29,000 acres on a narrow 18-mile long peninsula connected to land on its southeastern boundary. TAFB is bordered by East Bay to the northeast, St. Andrew Bay to the northwest, and St. Andrew Bay and the Gulf of Mexico to the south and southeast. TAFB is connected to the Panama City area by the Dupont Bridge via Highway 98.

U.S. Highway 98 bisects the base with the air field and industrial operations north of the highway. Administrative and residential areas are primarily to the south of the highway.

TAFB was activated in 1941 as a flexible gunnery school for the Army Air Corps and, beginning in 1946, it was an air tactical training school. In 1950, TAFB was transferred from the Air Training Command to the Aerospace Defense Command, and the mission changed to focus on weapons training and system evaluation as well as tactics, techniques, equipment testing, and tactical air defense (1).

In 1979, TAFB was assigned to the Tactical Air Command. The 325th Tactical Training Wing was established at TAFB in 1981 for the training for F-15 pilots and evaluation of

personnel and weapons (2-4). In July 1993, the Air Education and Training Command (AETC) was established at TAFB and the base remains under this command to date (5).

The Wherry Landfill is located in the Bay View Housing area on base. The landfill was used from approximately 1943 until 1948. The installation restoration program records search shows that the landfill was used for disposal of general refuse including mess hall waste. The landfill consisted of trenches, one half a mile long and 3 to 4 feet wide (2).

As part of the Installation Restoration Program, USAF released numerous documents that address potential human exposure to chemicals of concern at Tyndall Air Force Base. For the current inquiry, the following document was used: Remedial Investigation Activities Report for Sites LF001, LF003, and SS014, Tyndall Air Force Base, FL. October 2003.

Discussion

This Public Health Consultation (PHC) provides a review of the TAFB data and information which respond to the three ATSDR 1999 PHA recommendations for Wherry Landfill. The recommendations given in that PHA presented issues to be resolved. Those issues and their resolutions are given in the Discussion section of this consultation.

For clarity, this section restates the *Wherry Landfill ATSDR recommendations* of the 1999 PHA and then gives the follow-up *USAF public health action(s)* provided by the USAF in the Remedial Investigation Activities Report for Sites LF001, LF003, and SS014, Tyndall Air Force Base (2003). In some cases additional discussion will be given to further clarify events, findings, or actions leading to the conclusion or resolution of a particular recommendation.

ATSDR recommendation 1: *Provide information on the “perceived” boundaries of the landfill including information about the houses that were removed and any photographs or geophysical work. If necessary, revise the maps with the correct boundaries of the landfill.*

USAF Public Health Action 1:

USAF reviewed past records but was not able to find aerial photographs that better delineate the landfill boundaries. The only available photographs were taken in 1943 – where trenching activity is not visible and 1953 – which was 5 years after end of operations at the site. Any indication of site LF001, previously known as Wherry Landfill, has been obscured by housing construction. The boundary description for east-west trending trenching as stated in the 2003 RI report could not be accurate because the east-west trending trenches were one-half mile, or 2640 feet. This is inaccurate because the distance between highway 98 and the water feature to the east is 1500 feet. The trenches could not fit within that space. LF001 was used from approximately 1943 until 1948 and interviews with past and present base personnel show that it was used “for disposal of general refuse including mess hall waste. No known or suspected industrial type waste or hazardous refuse was disposed at this site. The operation consisted of one-

half mile long trenches, which were 3-4 feet deep.” Construction of the 179- homes took place in 1951 and in the mid 1970’s 25 units were removed due to cracked foundations. The site is currently included as part of the flight maintenance line and all houses are scheduled for demolition by 2008; 108 additional units has been demolished and 46 units are still in place (5). As of March 9, 2004, site reconnaissance conducted by the USAF shows 38 homes still in place and currently occupied. The proximity of the homes to the landfill is approximately 500 ft.

ATSDR Recommendation 2: *Sample subsurface soil gas around the periphery of the landfill to determine if contaminated soil gas is present and migrating to the adjacent houses. If soil gas is present, determine the soil gas migration pathways and plume extent. If houses are located in these pathways or over the gas plumes, the indoor air of those houses should be sampled.*

USAF Public Health Action 2:

To determine if soil gas was present, an organic vapor analyzer (OVA) equipped with a flame ionization detector (FID) was used to collect headspace analysis during the February 2003 soil sample collection. In February 6 and 7, 2003, 29 samples were taken at site LF001 with OVA. Low concentrations of organic vapor were detected near the water table in the eastern half of the site. OVA concentrations ranged from 0 to 11 parts per million (ppm) – equivalent to less than 1% methane by volume of air (5).

The concentration of methane gas from samples at site LF001 indicates that the methane in air is below explosive levels; concentrations below 15% methane in air are not explosive because oxygen concentrations are too low to create an ignitable environment. These levels of methane in air are too low to migrate or accumulate.

At site LF001, groundwater flows east to southeast (5), indicating that the flow of methane is away from the homes at Bay View Housing area. This water flow further shows that there is no migration of methane gases to adjacent houses.

ATSDR Recommendation 3: *Take additional groundwater elevation readings to determine seasonal groundwater flow directions. Reevaluate the current theorized groundwater flow direction and provide information about the tidal influence on groundwater elevations. Provide information about wells in the vicinity to determine whether the flow direction is relevant to exposure and to confirm that there are no drinking water wells that could be contaminated.*

USAF Public Health Action 3:

Tyndall AFB is included in the Apalachicola Embayment Groundwater Region and the Northwest Florida Water Management District (NFWFMD). The hydrology system that underlies Tyndall AFB – from youngest to oldest are:

- The surficial aquifer system
- Intermediate system

- Floridan Aquifer system

The surficial aquifer system near the base is made of highly transmissive well-sorted, fine to medium grained sands, which extend up to 110 feet deep. Groundwater is under confined table conditions and is found at depths ranging from 1 foot to 10 feet below land surface. The water table is relatively flat at Tyndall AFB but it fluctuates up to 5 feet in response to seasonal rainfall and tidal cycles. Surficial aquifer groundwater flow is regionally south towards the Gulf of Mexico; however, locally shallow groundwater flows toward nearby bayous, streams, and ditches. At site LF001 groundwater flows to the east-southeast. At Tyndall AFB the surficial aquifer system is not used as a water source and regionally is of minor importance as a water source. This aquifer is the most susceptible to contaminant impact and transport because it is both permeable and shallow.

The intermediate system is approximately 200 feet thick beneath Tyndall AFB and is highly effective as a confining unit – limiting the amount of recharge to the Floridan aquifer system it is relatively stagnant, resulting in the presence of highly mineralized water in the basal portion of the aquifer. The Floridan aquifer, which is 200 - 300 ft beneath the surface, ranges from 800-1600 feet thick and exists under confined conditions at Tyndall AFB. Surface water supplies and low volume wells tapping the upper portion of the Floridan aquifer are sufficient to meet demand.

A study conducted on the influence of Tidal cycles on groundwater elevations at Tyndall AFB showed that there is no significant tidal effect on the shallow portion of the surficial aquifer, but a large effect in the deep portion of the Surficial aquifer. In the shallow portion of the aquifer the water levels are flat over the tidal cycles; in the deep portion of the aquifer, the water levels are found to decrease at low tide and increase at high tide. Vertical gradients between the shallow and deep portions of the surficial aquifer at the site vary as a function of site location and in relation to the tide. The vertical gradients are downward in the western area of the site during high and low tide. On the other hand, closer to shore, the vertical gradients are downward following a low tide and upward following a high tide (6).

In the 2003 remedial investigation (RI) the USAF inventoried wells within and or intersecting a one mile radius of site LF001 and LF003. The purpose of the inventory was to evaluate if any of the potable water supplies and large capacity pumping wells might be influenced by contaminants of potential concern and or how the wells might influence or alter the direction of the site groundwater flow. NFWMD well construction permits identified 415 monitoring well, 23 landscape irrigation wells, 1 outside well, 4 heat pump supply wells, 2 limited use public wells, and 4 domestic wells within and or intersecting a 1 mile radius of the site.

The two limited use public wells and 4 domestic wells are located north of East Bay and significantly outside the 1 mile radius of the three sites; these wells are not considered targets for potential contaminant migration from Tyndall AFB sites because a surface water body lies between the base and the wells and because of the distance between the sites at Tyndall AFB and the wells. Of the 23 landscape irrigation wells identified, 5

wells were located on Tyndall AFB; 3 out of these 5 wells are completed at depths below 300 feet and would not affect groundwater flow in the surficial aquifer.

Water samples were collected for the RI in February 2003 from existing monitoring wells. Groundwater samples were collected from all wells that exhibited analytical exceedances on previously collected groundwater samples. Groundwater samples were analyzed for all exceedance parameters previously detected specific to the well. For site LF001, groundwater samples previously collected from one of the three onsite monitoring wells exceeded the secondary MCL for manganese (LF0001-MW-03). New well (LF0001-MW-03) groundwater sample results showed that levels of manganese-detected at 95 ppb - were below ATSDR Substance Comparison Values (chronic RMEG = 500ppb) Class II Surface Water Quality (100 ppb) and EPA Region III Risk-Based Nonfood Concentration (730 ppb) (5).

After reviewing the data provided by USAF, ATSDR can determine that the recommendation has been met and there are no exposure pathways that may affect human health. Data showed that groundwater is not influenced by tidal effects and does not act as a pathway for contaminants of concern. The data also showed that there are no drinking wells that could be contaminated in the vicinity of TAFB. As stated earlier, at site LF001, groundwater flows east to southeast in the surficial aquifer(5), indicating that the flow of methane and other contaminants, i.e. manganese, flows in the opposite direction of the wells (2 public and 4 domestic wells located north of East Bay and north east of site LF001).

Conclusion

In the 1999 PHA, ATSDR was concerned that methane gas could be generated by the landfill and under certain conditions migrate into homes creating an explosion hazard. The USAF has sampled the soil gas and provided information to ATSDR. ATSDR determined that methane concentrations in and around Wherry Landfill are too low to migrate or accumulate. Therefore, explosion is not likely. The USAF has taken measures to adequately address ATSDR's concerns about Wherry Landfill. Therefore, ATSDR revises its 1999 conclusion. Soil gas migrating from Wherry Landfill presents no public health hazard to nearby residents. Moreover, site LF001 currently is included as part of the flight maintenance line and all residences are schedule for demolition by 2008.

Recommendations

None

ATSDR Preparers

Angel Sanchez
LTJG, United States Public Health Services
Environmental Health Scientist
Federal Facilities Assessment Branch
Division of Health Assessment and Consultation

Carole D. Hossom
Environmental Health Scientist
Federal Facilities Assessment Branch
Division of Health Assessment and Consultation

References:

1. Agency for Toxic Substances and Disease Registry. Public Health Assessment for Tyndall Air Force Base, Panama City, FL. December 30, 1999.
2. CH₂M Hill. Installation Restoration Program Records Search for Tyndall Air Force Base. Florida, December 1981.
3. Black & Veatch. General Plan – Tyndall Air Force Base. Florida, June 1996.
4. Booz Allen & Hamilton. Management Action Plan – Tyndall Air Force Base. Florida, October 1996.
5. CH₂M Hill. Remedial Investigation Activities Report for Sites LF001, LF003, and SS14 Tyndall Air Force Base. October 2003.
6. Remedial Investigation and Baseline Risk Assessment Report OT029 for Tyndall Air Force Base. December 2002.