Marine Corps Base Camp Lejeune chronology of significant events concerning Vapor Intrusion at the Hadnot Point Industrial Area.© Compiled by Jerry Ensminger, Jim Fontella and Mike Partain for use by WWW.TFTPTF.COM

Introduction – This time line was compiled by means of public documents available from the State of North Carolina, CERCLA and CLW files kept under requirements of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. We recently obtained a redacted release of a previously undisclosed Navy Underground Storage Tank (UST) Portal for Camp Lejeune. However, there are many documents that still have not been released or are currently being suppressed from public view. As these documents become available, we will update this time line and promptly post it on our website.

May 1 1988 – Feasibility Study for Hadnot Point Industrial Area (HPIA) prepared by Environmental Science and Engineering for MCB Camp Lejeune. As a result of the contamination of groundwater and soil found aboard Camp Lejeune, the contractor recommended five interim alternatives implemented to reduce immediate health risks at the HPIA. The second recommendation was ambient air monitoring for the interiors of buildings near "hot spots" of contaminated groundwater or high levels registered during the soil and gas analysis. Benzene, toluene, xylene, TCE, DCE and vinyl chloride were all listed as chemicals of concern. The contractors advised that the compounds could be measured by a HNU photo-ionizer and organic vapor analyzer. ESE stated that sampling should be taken during varying climatic conditions and that if a compound was detected above the threshold limit, immediate measures should be taken to reduce health effects until permanent remediation measures can be taken. **(CERCLA 428)**. Soil and gas readings taken by ESE indicated the presence of contaminants bear buildings: 1100, 1202, 1300, 1302, 1502, 1601,1602, 1701 and 1710. (**CERCLA 258).** Draft forms of this document were also found containing an October 1987 date.

August 1 1988 – Letter from AC/S Facilities, Colonel Dalzell to AC/S Manpower U.S. Naval Hospital Camp Lejeune concerning 5 interim measures recommended by the Navy's contractor (ESE) to address deal with immediate health risks in the Hadnot Point Area. Colonel Dalzell also scheduled two meetings to address these concerns immediately prior to a Technical Review Committee meeting scheduled for 9 August 1988. Colonel Dalzell requested the Hospital's Preventive Medicine Unit to address Ambient Air Monitoring for VOCs including benzene, toluene, xylene, TCE, and vinyl Chloride in selected buildings within the Hadnot Point Industrial Area. **(CERLCA 260 Pdf 2).**

Aug 9 1988 Technical Review Committee meeting held at Camp Lejeune. Representatives from the State of North Carolina, the US EPA, the community, Navy and Base Personnel attended the meeting. One of the highlighted topics for discussion was the Interim measures recommended in the Focused Feasibility Study conducted by ESE to protect against health risks and prevent further contamination at the HPIA**. (CERCLA 47).**

1. High soil and gas samples were identified at buildings 1202 (37,000 ppb) and towards the 1500, 1600, and 1700 series there was a reading at 703,000 ppb **(pdf 20).**
2. Base Environmental Engineer, Robert Alexander, reported that they were working closely with the base's Safety and Occupational Health personnel to accomplish the ambient air and underground work space monitoring to make sure "no compounds (were) present inside the work spaces in these buildings that may be near these things which could have a long term chronic adverse health affect on the occupants of the building **(pdf 39)**."
3. Mr. Alexander later went on to report that they were waiting for approval of a key piece of equipment from the Navy in order to complete the ambient air testing for the HPIA buildings **(pdf 41).**

Aug 25 1988 – Letter from Commanding Officer Naval Hospital Camp Lejeune to Commanding General Camp Lejeune in response to Colonel Dalzell's 1 August 1988 request for assistance with ambient air monitoring aboard Camp Lejeune. H. P. Scott advised the Naval Hospital was unable to perform the requested testing due to a lack of personnel and recommended contracting out the needed services. The Hospital Commander did agree to provide actual worker exposure monitoring and/or medical surveillance if the ambient air monitoring results were found to be excessive. **(CERCLA 260 pdf 8).**

September 9 1988 – Letter to Tom Caulfield (TRC member) from Colonel Dalzell advising him that the interim measures to deal with any immediate health risk in the HPIA have been or are being implemented. The measures cited included ambient air monitoring. Mr. Caulfield (along with the other TRC members) was advised that a full report of these interim measures was to be made at the next TRC meeting expected to be held in January 1989. **(CERCLA 587).** It is not known whether the January 1989 TRC meeting was held. We have been unable to locate the transcripts.

October 5 1988 -- Letter from AC/S Facilities, Colonel Dalzell, to NavFacEngCom regarding recommendations from the Hadnot Point Feasibility Study. Colonel Dalzell advised LantDiv, that the base Naval Hospital did not have the capabilities to conduct work place monitoring as recommended in the Hadnot Point Feasibility Study. **(CERCLA 260 pdf 1).**

August 1 1989 – Letter from Perry Nelson, State of North Carolina Groundwater Section to Commanding General Camp Lejeune updating the state's previous notice of violation dated May 15 1985 notice of violation. In the letter, Mr. Nelson advised that in 40 CFR 280.62 (Initial abatement measures and site check) the base was required to monitor and mitigate any additional fire and safety hazards posed by vapors or free product that have migrated from the UST excavation zone and entered into subsurface structures (such as sewers and basements). (**NC State Archives August 01 1989).**

September 1989 – Letter to Rick Shiver Wilmington Regional Office from AC/S Facilities B. W. Elston, Camp Lejeune regarding the 1 August 1989 Letter from Perry Nelson. Mr. Elston advised Mr. Nelson that the base's position on 40 CFR 280.61 a, b and c was that the requirements were met. No mention was made about 40 CFR 280.62. The base also advised they believed they were no longer leaking fuel and as such continued to operate the fuel farm.

January 8 1990 – Letter from Commanding General Camp Lejeune to Commander NavFacEngCom concerning Remedial Investigation/Feasibility Study (RI/FS) contract response to agency comments on Hadnot Point RI/FS. In this letter Camp Lejeune agreed with the EPA's concern that a risk assessment be conducted on all sites as well as addressing all affected media in the revised Feasibility Study for Hadnot Point. **(CERCLA 326).**

December 19 1991 – Letter to Carl Froede, EPA Waste Management Division from Paul Rakowski Head Environmental Programs Branch LantDiv regarding responses to EPA comments for the Draft RI/RA/FS for Hadnot Point Shallow soils/Deep Groundwater. The EPA wanted inhalation to be considered as a legitimate pathway. Mr. Rakowski responded "Inhalation was considered to be an insignificant pathway since groundwater to air could not be established as an exposure pathway. **(CERCLA 27 Pdf 15).**

1996 Hadnot Point Fuel Farm Product Evaluation. A contractor for the Navy estimated the fuel loss total to be 1,061,901 gallons of product based on a 50 year operational period and an average loss of 21,200 gallons of fuel per year. **(1996 HPFF Product Eval, Navy UST).**

June 20 1997 – Leaking Underground Storage Tank Comprehensive Site Assessment HPFF prepared by Catlin Engineering. Catlin advised that several buildings were located near the project site and as such there was a risk that the utility trenches for these buildings could act as a preferential pathway for contaminant migration. Catiln also identified vapor inhalation as a possible pathway exposure at the project site. **(NAVY UST 457 Pdf 22).**

August 1997 – ATSDR released their Public Health Assessment for Camp Lejeune. Vapor intrusion was not listed as an exposure pathway or risk for the personnel working in the Hadnot Point Industrial Area. **(ATSDR 1997 PHA for Camp Lejeune)**.

April 30 1998 – Leaking Underground Storage Tank Corrective Action Plan (CAP) prepared for NavFacEngCom by Catlin Engineering. Catlin Engineering identified that prolonged or repeated exposures to some petroleum substances in liquid or vapor form may cause serious illness including cancer in laboratory animals. Existing buildings (1100, 1103, 1108 and 1115) were at risk for exposure to petroleum hydrocarbon vapors because of the existence of contaminated underground plumes located underneath them. Catlin also stated that the main control building for the Temporary Fuel farm (building 1005) had been evacuated several times due to the presence of

petroleum hydrocarbon vapors. **(NAVY UST 456 pdf 24 and 27).** According to the Occupational Safety and Health Standards, an eight hour time weighted average for benzene exposure is 1 ppm with an acceptable ceiling concentration of 5 ppm and an acceptable peak of 50 ppm for 10 minutes. **(NAVY UST 456 pdf 486).**

April 1 1999 – Complaint made about fuel odors at building 1101. **(Navy UST 670 Pdf 54).**

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June 1 1999 -- Complaint made about fuel odors at building 1101. **(Navy UST 670 Pdf 54).**

July 1999 – OHM responded to additional odor complaints at building 1101. OHM cored the outer grade beam beneath the office in building 1101 which had the highest FID levels (these test results have not been located) and procured samples of soil for a distance of five feet. The samples were found not to be contaminated. **(NAVY UST 22 Pdf 39).**

November 30 1999 – Monthly Progress report for the Construction and Operation of the Bio-Sparge and Air Sparging for the HPFF and Building 1115. The report noted that odor complaints were made at building 1101 during the month. OHM Representatives met with base personnel on several occasions. **(NAVY UST 257 Pdf 4).**

Nov/Dec 1999 -- Odors reported in building 1101. Building 1101 housed the Marine Corps Community Services Warehouse, Information Management Division and Base Communications. **(Power Point Presentation for HPFF Vapor Intrusion/Risk Communication.)**

December 10 1999 – Three workers reported nausea, headaches, eye irritation and respiratory irritation. Two patients reported to the Occupational Health Clinic. Samples were collected by Industrial Hygiene and Base Safety. They found high readings of gasoline vapors. The building was evacuated and ventilation fans were installed. The HPFF AS system was suspected to be a cause for the vapor intrusion and shut down. **(Power Point Presentation for HPFF Vapor Intrusion/Risk Communication.)**

January 8,11, and 13th 2000 – During this time, three Jacksonville Daily News articles concerning reported odors and subsequent evacuation of Building 1101 were published. The building was evacuated on 29 December and the problem was first thought to be a gas leak under building 1101. Three days later, Joint Public Affairs Officer (JPAO) Major Scott Fazekas attributed the odors of gasoline within building 1101 to lost fuel from the base's fuel farm. He stated that 100,000 gallons of the fuel had leaked into the ground over a period of 30 years and the Environmental Management Division had recovered 30,000 gallons of that fuel. This statement was then subsequently revised on 13 January when Maj Fazekas upped the total of lost fuel to 200,000 gallons (Please see the prior entry for the year 1996). The Major stated that "people had smelled fumes in the building a few weeks before but that day, they noticed more vapors in the building than they had before." The Major then added that building 1101 was evacuated as a precautionary measure because they "were more worried about the worker's risk of inhaling fumes than anything exploding." In the final article Major Fazekas offered an explanation for the presence of fuel vapors in building 1101. "the Flood of the century that we had pushed the groundwater higher. As the groundwater rose, it pushed the gas floating on it up through the soil into the air. "the Major was also quoted as stating "The safety of our workers and Marines is paramount. We won't be using the building until the problem has been resolved." **(JDN Articles Jan 8,11,13 2000).**

February 9 2000 – A ten foot interceptor trench was installed along the East side of building 1101. A vacuum was applied to extract vapors out and exhaust them to the atmosphere. Upon the installation of the trench, vapor levels in the building dropped. **(NAVY UST 1185 Pdf 523.)**

March 2000 – The Air Sparging System was reactivated and the Navy determined that vapor levels in the buildings was the result of rainfall and not the air sparging system for the Hadnot Point Fuel Farm. **(2010 NAVY PP Presentation Glenee Smith).** Note, this assertion was made 10 years after the fact.

March 15 2000 – Camp Lejeune re-energized the Air Sparging and Biosparge systems to test the effectiveness of the SVE trench at building 1101. Air monitoring results remained "undetectable". **(NAVY UST 1185 Pdf 523).**

April 14 2000 – Email to Brent Rowse and Nicole Hall from Lori Reuther, NavFacEngCom regarding the modified scope of work for the HPFF and Building 1115. Ms. Reuther advised Camp Lejeune that time was running out for funds to either demolish, caulk or excavate soil for the buildings affected by vapor intrusion in the HPIA. The attached scope of work read: **(NAVY UST 1185 Pdf 431-433).**

1. An ongoing effort is underway to permanently eliminate vapors in building 1101 and prevent associated problems in other buildings located in the HPFF site.
2. A baseline reconnaissance survey and daily monitoring exercise is being conducted for all inhabited buildings along Ash Street in proximity to the remediation system.
3. The buildings involved are 1100, 1102, 1103, 1104, 1105, 1108, 1111, 1113, 1114, and 1115.
4. Buildings 1102, 1103, 1104, 11111, 11113, and 1114 were slated to be caulked to prevent further vapor intrusion.

May 2000 – The Base Safety Manager recommended building 1101 be reoccupied provided there was fixed VOC/Benzene monitoring equipment installed and maintained, remediation efforts continued, mobile personnel be allowed in the building, IH, Fire Protection and Base Safety continue to monitor for vapors. **(NAVY PP Presentation Glenee Smith).**

July 2000 – LantDiv Recommended demolition of non mission critical buildings 1102, 1103, 1104, 1113 and 1114, Base Safety and Fire Department personnel conduct Low Explosive readings, and that the 1101 be returned to its orginal purpose as a warehouse including thr removal of the enclosed office spaces within the building. **(2010 NAVY PP Presentation Glenee Smith).**

October 31 2000 – The SVE (Soil Vapor Extraction) Trench system installed in January 2000 at building 1101 to assist with mitigating vapor intrusion removed 9,326 gallons of fuel contaminated vapor and was still in operation at the time of the report. **(NAVY UST 670 pdf 30).**

November 2000 – Naval Environmental Health Center Consultative Assistance Team (CAT) recommended against full time occupancy of building 1101 and instead use it as a storage facility. This recommendation was implemented 22 November 2000. **(2010 NAVY PP Presentation Glenee Smith).**

November 22 2000 – Progress report for HPFF. Contractor reported that buildings 1108, 1115 and 1068 were re-caulked to close potential vapor pathways in October. The contractor also began work on "pigging" and grouting of the old HPFF fuel transmission lines. Some of these lines ran adjacent and/or underneath buildings in the HPIA including building 1101. **(NAVY UST 474 Pdf 11).**

February 8 2001 – Power Point Presentation from OHM Remediation Services Corp to the Navy's UST Environmental Division to explain the Persistence of Free Product in the Subsurface. In November of 1999, odors were detected in building 1101 on Hadnot Point. Although odors had been reported for years, no quantitative readings for the building existed prior to activating the Hadnot Point Fuel Farm Air Sparging System (AS). The Navy believed the AS system and excessive rains from three hurricanes (note that odors were first reported prior to hurricane season) were the causes for the odors and added a trench SVE system alongside building 1101 in February 2000 to help remediate the problem. **(NAVY UST 676).**

August 6 2001 – Letter to Regional Supervisor North Carolina Division of Air Quality from Scott Brewer, Director Environmental Division, Camp Lejeune regarding the Air Sparge and Soil Vapor Extraction (AS/SVE) groundwater remediation system operating adjacent to building 1068 in the HPIA. Mr. Brewer advised the state that the system was emitting VOCs and toxic air pollutants which exceeded the state limits and as such would need to be permitted by the state. **(NAVY UST 1185 Pdf 243).**

June 28 2002 – Phone conversation between Bruce Reed, North Carolina and Nikki Hall, Camp Lejeune regarding building 1101 and the Air Sparging system for the HPFF plumes. Ms. Hall advised that the system had been shut down since November of 2001 as they had still detected fuel vapors in the building as late as October 2001. She

also advised that the building was used as a warehouse with the doors open most of the time. Ms. Hall also advised that no offices were located in the building. Mr. Reed commented that he did not understand why the Air Sparging system had been cut off because that meant the ground water plume was not being treated. **(NC State Archives June 28 2002).**

October 31 2002 -- Email from Rick Raines, Camp Lejeune to Kirk Stevens LantDiv regarding the Site 78 Draft Pilot Study Project Plans. Mr. Raines advised that section 4.5 of the report did not discuss the potential for Vinyl Chloride build up at site 78 South if ORC/HRC were to be injected into the ground at high pressure. He asked Mr. Stevens what contingency plans were available to address the possibility. **(CERCLA 2999).**

December 3 2002 – Letter from Commanding Officer Navy Env. Health Center to Commanding Officer NavFacEngCom regarding the Medical Review of Draft Pilot Study Project Plans site 78 (HPIA), OU 1, Camp Lejeune. During his review, Dr. Rennix noted that two plumes were located near corners of buildings within site 78 (HPIA) but the groundwater directly under these buildings were not sampled thus establishing the possibility for air vapor intrusion into these buildings. **(Navy UST 3548).**

June 11 2003 – Revised Corrective Action Plan for HPFF by Catlin Engineering. In this report the Main Control room for the new HPFF (located NW of Building 1005) was evacuated sometime prior to the report due to the presence fuel vapors. A forced air ventilation system was installed to exhaust the vapors from a utility manhole outside the building. **(NAVY UST HPFF Revised CAP).**

July 16 2003 – Letter to EPA Region IV Project Manager, Gena Townsend from Scott Brewer, Director Environmental Management Camp Lejeune. Mr. Brewer submitted the Interim Final Documentation of Environmental Indicator (EI) Determination package for EPA review. The EIs were explained as important indicators used to measure progress for Government Performance and Results Act. Ambient Air was categorized to not be reasonably suspected to be contaminated above appropriately protective risk base levels. The submitted report indicated that several buildings in the HPIA had experienced vapor intrusion but no indoor air contamination had been detected during the last two years of monitoring. The indoor air contamination was identified in 2000. Mr. Brewer stated that Camp Lejeune responded by immediately evacuating all permanent employees and initiated an indoor air quality program. Buildings 1102, 1103 and 1113 were demolished. **(CERCLA 3555).**

February 11 2004 – 1100 Block Building Occupancy Update. The published fact sheet advised base personnel that as a result of sampling, clean up and engineering measures that Naval Environmental Health Center specialists agreed that it was safe to re-occupy buildings 1108 and 1115 on a full time basis. Base personnel were informed that Naval Hospital Industrial Hygiene and EMD personnel would continue to conduct close surveillance for vapor intrusion within the 1100 block area. According to the March 16 2005 update, building 1101 was later included in this release, though it does not appear as such in the announcement located in this document. **(NAVY PP Presentation Glenee Smith)**

November 2004 -- 1100 Block Building Occupancy Update. The published fact sheet advised base personnel that as a result of sampling, clean up and engineering measures that Naval Environmental Health Center specialists agreed that it was safe to re-occupy building 1100 on a full time basis. Base personnel were informed that Naval Hospital Industrial Hygiene and EMD personnel would continue to conduct close surveillance for vapor intrusion within the 1100 block area. **(NAVY PP Presentation Glenee Smith)**

March 16 2005 -- 1100 Block Building Occupancy Update. The published fact sheet advised base personnel that as a result of sampling, clean up and engineering measures that Naval Environmental Health Center specialists agreed that it was safe to re-occupy buildings 1104 and 1114 on a full time basis. Base personnel were informed that Naval Hospital Industrial Hygiene and EMD personnel would continue to conduct close surveillance for vapor intrusion within the 1100 block area. **(NAVY PP Presentation Glenee Smith)**

November/December 2006 – Elevated low explosive levels (LEL) greater than 10 percent once again necessitated the evacuation of building 1101. The Air Sparging system and electrical power to the building were secured. After this incident, Sub-slab Vapor Extractors were installed in buildings 1101, 1108, 1200, 1201, 1202, and 1301 to prevent vapor intrusion into the building's slab. The system was ventilated to through an exterior window. **(NAVY PP Presentation Glenee Smith).**

January 22 2007 – Email from Andrew Smith, Environmental Engineer Camp Lejeune to Bruce Reed, State or North Carolina concerning continued vapor readings in building 1101. Mr. Smith advised the base continued to detect vapors in the northern end of building 1101. Because vapor reading were in excess of "hot work" limits and low explosive level (LEL), the final phase of the vapor extraction system for building 1101 was not completed. Mr. Smith stated that once this critical step was completed (the vapor collection system in building 1101) that he believed it would have the same effectiveness in building 1101 as it did in the surrounding buildings. **(NC State Document Library).**

December 2008 – Building 1104 reported multiple interior fuel vapor readings between 1-12 ppm by a photo-ionization detector (PID). After several days of follow up resulted in non detections, no further action was taken. **(NAVY UST HPFF 2009 Final AMR).**

April 2010 – Final 2009 Annual Monitoring Report June 2009 through January 2010 Hadnot Point Fuel Farm/Building 1115 sites completed by Rhea Engineers and consultants. The risk of vapor intrusion necessitated the installation of active soil depressurization systems (ASD) at buildings 1101, 1108, 1200, 1201, 1202 and 1301.. The system consisted of a 2 inch diameter well screen installed beneath a building and connected to an electric blower to maintain negative air pressure. During the June 2009 to January 2010 monitoring period, 56,101 pounds of hydrocarbons was recovered from building 1101. **(Navy UST Final HPFF AMR 2010).**

August 15 2010 – Former Hadnot Point Fuel Farm (HPFF) Block 1100 Vapor Intrusion/Risk Communication briefing facilitated by Glenee Smith, Head Industrial Hygiene. During this briefing she recaps the history of the vapor intrusion problem at site 78. **(NAVY PP Presentation Glenee Smith)**