Appendix X: Toxics Release Inventory for Calendar Year 2005

Pollution Prevention

The Department of Defense (DoD) is diligent about complying with the Toxics Release Inventory (TRI) reporting requirements and reducing releases of toxic chemicals. TRI provides information about toxic chemicals released from a facility into the environment or transferred off-site for further waste management. Under the Emergency Planning and Community Right-to-Know Act (EPCRA) and the Pollution Prevention Act of 1990, the U.S. Environmental Protection Agency (EPA) maintains a publicly accessible toxic chemical database, known as TRI Explorer. Citizens, businesses, and governments can use this database to determine which toxic chemicals are present in their communities, and prepare for any potential emergency releases.

While certain facilities that meet the applicability criteria under EPCRA are required to report their releases and waste management activities annually to EPA, federal facilities are not subject to these requirements. However, Executive Order (E.O.) 13148, entitled "Greening the Government through Leadership in Environmental Management," requires each federal facility to comply with EPCRA, including the TRI reporting requirements. The E.O. also requires federal agencies to reduce reported TRI releases and off-site transfers of toxic chemicals for treatment and disposal by 10 percent annually, or by 40 percent overall by December 31, 2006.

E.O. 13148 established 2001 as the baseline year for the TRI reduction goals. The 40 percent reduction is in addition to the 50 percent reduction DoD already achieved between 1994 and 1999 under E.O. 12856, entitled "Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements." For DoD to further reduce their TRI releases would require significant resource investment and the development of new technologies to enable substitution while maintaining mission capability. Because of these challenges, DoD is not likely to meet the goal of a 40 percent reduction in TRI releases from a 2001 baseline by the end of Calendar Year (CY) 2006. A large portion of TRI-reported releases occur as a byproduct of critical DoD manufacturing and utilities processes. DoD cannot reduce these coincidentally manufactured chemicals, such as nitrate compounds generated from wastewater treatment and hydrochloric acid from coal-fired heating plants, without expensive, long-term infrastructure projects. Munitions life cycle activities also contribute to TRI releases, particularly those used on operational ranges and during demilitarization, because these processes do not benefit from standard pollution prevention approaches. A longer-term initiative for reducing TRI releases from munitions involves substituting chemicals in the munitions during the acquisition design phase. These changes will take time to have a significant impact on operational range TRI release totals.

TRI Reporting Requirements

The primary purpose of TRI reporting is to establish an inventory of toxic chemical releases and inform the public about both routine and accidental releases of toxic chemicals into the environment.

EPA's original reportable TRI list included 300 toxic chemicals. EPA selected these chemicals based on the criterion that each chemical's toxicity caused serious chronic or acute human health risks or adverse environmental effects. TRI chemicals are removed or delisted through either EPA-initiated action or an independent petition process. Under EPCRA §313(e), any person may petition EPA to add or delete a chemical from the TRI toxic chemical list based on certain criteria. EPA's TRI reporting program is constantly evolving through the addition and deletion of toxic chemicals, chemical categories, newly regulated facilities, and new data elements. The CY2005 TRI toxic chemical list contained over 600 chemicals and 30 chemical categories.

DoD installations that manufacture, process, or otherwise use a TRI toxic

chemical in quantities greater that the established threshold over the course of a calendar year, must report all releases and waste management activities on chemical inventory forms (Form Rs). TRI-reported releases may have been released evenly over the course of the calendar year, intermittently, or in a single event. A facility may revise its TRI-reported data if new information, better data, or more accurate measurement tools become available, even if this occurs after the reporting deadline has passed. Enabling facilities to revise historical data encourages review and recalculation of original data submissions to improve accuracy.

Submissions are due to EPA and state authorities by July 1 of each year for activities that occurred during the previous calendar year. Although the reporting period for this Defense Environmental Programs Annual Report to Congress covers Fiscal Year 2006 (October 1, 2005, through September 30, 2006), the TRI reporting period covers CY2005 (January 1, 2005, through December 31, 2005).

Major Changes to Reporting Requirements

As a result of both EPA changes and DoD interpretations of the TRI reporting requirements, TRI data reported by facilities have changed in the past six years. The most significant changes are described in detail below:

- + Munitions Demilitarization
- + Persistent Bioaccumulative Toxic Chemicals
- Range Reporting
- Coincidental Manufacturing
- Deletion of Methyl Ethyl Ketone.

Munitions Demilitarization

In 2000, DoD began reporting releases and off-site transfers from munitions demilitarization activities. Although reporting releases associated with these activities was not a new requirement, DoD deferred reporting until detailed guidance and tools were developed to ensure consistent reporting.

The Department maintains a large stockpile of munitions. As munitions reach the end of their useful life, it is necessary for DoD to demilitarize excess, obsolete, or unserviceable munitions. Demilitarization activities vary depending on mission requirements, mission activity levels, and the budget available for demilitarization actions.

Persistent Bioaccumulative Toxic Chemicals

In 2000, EPA lowered the reporting threshold for persistent bioaccumulative toxic (PBT) chemicals and added other PBT chemicals to the TRI list of toxic chemicals. PBTs are of concern because they are toxic, remain in the environment for long periods of time, are not readily destroyed, and can accumulate in body tissue.

These lower thresholds required facilities, including DoD installations, to report the amount of PBT chemicals released into air, land, and water at much lower quantities than were previously reported. EPA finalized two thresholds based on the chemical potential to persist and bioaccumulate in the environment. The two levels include setting manufacture, process, and otherwise use thresholds to 100 pounds for PBT chemicals and to 10 pounds for a subset of PBT chemicals that are highly persistent and highly bioaccumulative. The dioxin and dioxin-like compounds category is an exception with a threshold of 0.1 grams.

In 2001, EPA classified lead and lead compounds as PBT chemicals and lowered the 25,000 pound and 10,000 pound thresholds. Lead and lead compounds were on the original TRI toxic chemical list, but with the ruling, EPA reclassified lead and lead compounds as PBT chemicals due to their bioaccumulative properties. Facilities that manufacture, process, or otherwise use more than 100 pounds of lead or lead compounds must now report releases and off-site transfers, with the exception of lead contained in stainless steel, brass, and bronze alloys. For stainless steel, brass, or bronze alloys (referred to as "qualified alloys") that contain lead, the quantity of lead contained in these alloys is still applied to the 25,000 pound and 10,000 pound reporting thresholds.

Range Reporting

Beginning in 2001, DoD reported releases and off-site transfers associated with operational range activities, including training, live fire, and clearance activities. DoD developed and implemented the necessary tools, such as the TRI Data Delivery System, to identify and report releases from munitions activities on operational ranges, because these methods were not previously available. The system uses emissions factors and munitions use information supplied by installations to calculate the amount of TRI toxic chemicals released. The requirement for reporting operational range training activities resulted in many installations that previously were not required to file Form Rs, including many National Guard bases and Reserve installations.

Coincidental Manufacture

In 2001, DoD published a question and answer document that clarified the reporting of toxic chemicals coincidentally manufactured during other processes. Facilities must calculate the amount of TRI chemicals coincidentally manufactured and released as a byproduct and count it towards their TRI threshold. For example, nitrate compounds, one of the most common chemicals reported at DoD installations from coincidental manufacturing, are often produced during wastewater treatment. Other common chemicals reported from coincidental manufacturing include coal combustion byproducts. Facilities that use coal, fuel oil, and other raw materials have the potential to coincidentally manufacture toxic chemicals such as sulfuric acid, hydrochloric acid, hydrogen fluoride, and metal compounds. The presence of chlorine in coal results in the coincidental manufacture of hydrochloric acid during the coal-burning process.

In 2005, 26 facilities reported nitrate compounds, compared to 14 facilities in 2001. Many facilities have since revised their data and submitted updates to EPA to include releases from coincidental manufacturing processes.

Deletion of Methyl Ethyl Ketone

In 2005, EPA published a final rule deleting methyl ethyl ketone (MEK) from the list of TRI toxic chemicals. On May 10, 2005, the D.C. Circuit Court of Appeals ruled in favor of the American Chemistry Council, who had petitioned EPA to remove MEK from the list of toxic chemicals subject to the TRI reporting requirements. The D.C. Circuit Court of Appeals ruled that MEK does not meet the EPCRA toxicity criteria. As a result, facilities are no longer required under EPCRA §313 to report MEK releases and other waste management information, beginning with those activities that occurred during the 2004 reporting year.

2006 EPCRA Policy

In 2006, DoD's EPCRA/TRI Working Group, composed of DoD and Component subject matter experts, finalized an EPCRA policy entitled "Consolidated Emergency Planning and Community Right-to-Know Act (EPCRA) Policy for DoD Installations, Munitions Activities, and Operational Ranges." This policy explains how E.O. 13148 policies, goals, and requirements apply to DoD installations, and it consolidates and supersedes all previous DoD EPCRA policies issued by the Office of the Secretary of Defense.

In addition, the guidance discusses a new approach to reporting operational ranges, effective for CY2007 (TRI reports due to EPA on July 1, 2008). DoD reevaluated their interpretation of the EPCRA definition of a facility, and determined that a facility includes "all buildings, equipment, structures, and other stationary items...." Although this definition is expansive, it may not apply to some DoD facilities, including many operational ranges with few or no structures. Some operational ranges may contain stationary targets, however, these buildings or structures do not "manufacture, process, or otherwise use" TRI toxic chemicals and would not be subject to EPCRA §313 threshold quantity calculations. The DoD Working Group also determined that where it is not practical to aggregate individual facilities on a range to make threshold determinations, a Service may view an entire operational range as a facility. Once a DoD installation determines that it is subject to reporting for a toxic chemical, the installation is to report any releases from all non-exempt activities throughout the entire installation. When reporting releases, operational range activities will continue to be tracked separately from the main installation activities. To make this process more efficient, both the installation and associated operational range would report as "Part B" in Part I, Section 4.2 on the Form R using the distinct name but the same TRI Facility Identification Number (e.g., Facility A and Facility A Range).

DoD's 2005 TRI Report

Calculating, reporting, and reducing TRI releases and off-site transfers is a priority at DoD facilities. By complying with TRI reporting requirements, DoD can identify:

- Processes that produce releases and off-site transfers of TRI toxic chemicals
- + Procedures or processes that require the use of TRI toxic chemicals
- Pollution prevention opportunities.

This analysis helps DoD develop a strategy for reducing releases and off-site transfers of TRI reportable chemicals. By reducing the use of toxic chemicals,

DoD minimizes its impacts on the environment, DoD personnel, their families, and surrounding communities.

In CY2005, DoD reported releases and off-site transfers of 16.6 million pounds, an increase of 10.7 percent from the CY2001 TRI baseline total. The increase from CY2001 through CY2005 is primarily due to increased activities to support mission requirements, deployments, and training.

When subtracting the chemical amounts reported from operational range activities, DoD released and transferred off-site 9.8 million pounds of TRI chemicals in CY2005. Compared to the CY2001 non-range release totals of 10.6 million pounds, 2005 releases represent a decrease of 7.5 percent. As shown in Figure X-1, range installation releases accounted for approximately 41 percent of the total DoD reportable releases in CY2005.

TRI releases prior to CY2000 were largely air releases from painting, depainting, and cleaning operations. Releases to land and water represent the majority of TRI releases in CY2005, as shown in Figure X-2. Releases to land are primarily metals from munitions used on training ranges or treated during open burning and open detonation (OB/OD). Releases to water are mainly nitrate compounds released as a byproduct of wastewater treatment operations. These types of releases have not been the traditional focus of installation pollution prevention programs.

Figure X-3 shows DoD's toxic chemical releases and off-site transfers since CY2001, not including range facilities. This figure demonstrates an increase in the amount of chemicals released or transferred off-site in 2005 from the previous year. The largest increase is from chemicals sent off-site for treatment. The highest quantity of chemicals sent off-site for treatment included hexachloroethane, dichloromethane, and chlorobenzene.

Figure X-4 illustrates DoD's overall reportable quantities of toxic chemical releases and off-site transfers, including releases from operational ranges. In CY2001, 69 facilities reported due to range-only activities, with 4.4 million pounds of releases and off-site transfers. By CY2005, the number of range installations and range releases had increased, with 71 facilities reporting 6.8 million pounds of releases and off-site transfers. This increase is primarily the result of increased activities associated with training and deployments.

Figure X-1 Percentage of Components CY2005 TRI Releases from Ranges

Component	Percentage
Army	47.97%
Navy	5.96%
Marine Corps	58.13%
Air Force	22.19%
DoD	40.98%



Top Ten Chemicals Reported in 2005

Changes in TRI reporting requirements and the new DoD interpretation of TRI reporting requirements have vastly changed the makeup of the top ten list since the last baseline year for reductions in 1994. The top ten chemicals released in CY2005, as shown in Figure X-5, were similar to 2004's top ten list except for the omission of toluene and the addition of xylene. Even

though toluene releases increased 24 percent in 2005 from 2004, the releases were less than other chemicals, dropping the chemical from the top ten list.

Releases of nitrate compounds and hydrochloric acid continue to remain high due to coincidental manufacture reporting requirements. In 2005, there was a 25 percent reduction in hydrochloric acid releases dropping the chemical from fifth in 2004, to eighth on the 2005 top ten list. In addition, the total releases

Figure X-3 DoD TRI Reportable Quantities, Not Including Ranges (Pounds Released or Transferred)						
Category	2001	2002	2003	2004	2005	2001 - 2005 % change
On-site to Water	4,440,131	5,001,387	4,795,961	5,286,088	5,225,619	17.69%
On-site to Air	2,995,428	2,784,618	2,897,006	2,120,243	2,128,126	-28.95%
On-site Underground Injection	0	0	0	0	0	-
On-site Land	1,563,549	1,893,674	1,411,830	1,053,999	1,173,245	-24.96%
Off-site to POTW	220,140	270,355	208,522	148,672	111,007	-49.57%
Off-site Treatment	474,080	580,222	479,707	336,650	618,555	30.47%
Off-site Disposal	945,823	1,051,353	1,098,039	640,284	569,423	-39.80%
Total	10,639,152	11,581,609	10,891,065	9,585,936	9,825,975	-7.64%

Figure X-4						
DoD TKI Keportable Quantities, Including Kanges						
	(Pounds R	eleased or Transte	rred)			
Category	2001	2002	2003	2004	2005	2001 - 2004 % change
On-site to Water	4,440,158	5,002,923	4,796,003	5,286,242	5,225,848	17.70%
On-site to Air	3,022,163	2,825,150	3,107,041	2,188,518	2,183,607	-27.75%
On-site Underground Injection	0	0	0	0	0	-
On-site Land	5,897,764	7,624,589	7,879,300	6,518,427	7,747,163	31.36%
Off-site to POTW	220,140	270,355	208,522	148,672	221,007	0.39%
Off-site Treatment	474,080	580,222	479,707	336,650	618,555	30.47%
Off-site Disposal	988,849	1,051,985	1,098,065	640,445	651,428	-34.12%
Total	15,043,155	17,355,224	17,568,637	15,118,954	16,647,609	10.67%

for dichloromethane, aluminum (fume or dust), and ethylene glycol increased from the previous year, moving hydrochloric acid lower on the top ten list.

Releases of heavy metals such as copper, lead, lead compounds, aluminum (fume or dust), and zinc (fume or dust) occur on operational ranges and during munitions demilitarization activities. DoD's reporting of releases from operational ranges remains high as a result of increased activities associated with training and deployment operations.

Dichloromethane is one of the main components released during aircraft and vehicle maintenance. Suitable alternatives to these chemicals, which are integral to operations, have yet to be developed.

Xylene releases increased 39 percent in 2005 from 2004, because several installations reported higher releases. Ethylene glycol appears on the top ten list with an increase of 85 percent in 2005 from 2004.

Top Ten Installations Reported in 2005

The nature of DoD's 2005 top ten installations is similar to the 2001 baseline, even though some of the installations have changed. In 2005, installations involved with the lifecycle of munitions (manufacturing, use, and demilitarization) were DoD's largest reporters of TRI releases and off-site transfers, as shown in Figure X-6.

Radford Army Ammunition Plant remained the largest contributor of DoD's releases with the largest releases of nitrate compounds. In 2005, Radford Army Ammunition Plant had a 8.5 percent reduction in releases from 2004. Pearl Harbor Naval Complex and Marine Corps Base (MCB) Camp Lejeune also reported high levels of nitrate compounds. Both of these installations' releases are attributable to discharges from wastewater treatment plants.

Anniston Army Depot reported releases associated with demilitarized munitions, typically from OB/OD. Releases from munitions disposal include heavy metals similar to those from operational ranges.

Twentynine Palms Range, Fort Bliss Air Defense Artillery Center and Ranges, Fort Sill Field Artillery Range, Fort Bragg Range, and Fort Benning Range reported releases and off-site transfers associated with operational range activities, including range training, live fire, and clearance activities.

Figure X-5 Top 10 CY2005 DoD TRI Chemicals

Chemical	Pounds Released or Transferred
Nitrate Compounds	5,606,492
Copper	3,795,625
Lead Compounds	1,698,960
Lead	1,122,994
Dichloromethane	479,107
Aluminum (Fume or Dust)	382,249
Ethylene Glycol	373,216
Hydrochloric Acid (1995 and after "Acid Aerosols" only)	342,039
Zinc (Fume or Dust)	311,654
Xylene	268,356

Figure X-6 Top 10 CY2005 DoD TRI Installations

Installation	Pounds Released or Transferred
Radford Army Ammunition Plant	2,798,258
Anniston Army Depot	694,698
Twentynine Palms Range	622,052
Pearl Harbor Naval Complex	517,958
Marine Corps Base Camp Lejeune	504,922
Fort Bragg Range	459,717
Fort Sill DPW/EQD	454,457
Puget Sound Naval Shipyard	377,515
Fort Benning Range	371,939
Fort Bliss Air Defense Artillery Center & Range	360,820

Range releases generally consist of copper, lead, copper compounds, and lead compounds.

Puget Sound Naval Shipyard reported high releases of copper compounds, n-butyl alcohol, and xylene (mixed isomers), primarily as a result of ship maintenance. High releases of metals (e.g., lead and copper) were a result of normal disposal operations. In addition, Puget Sound Naval Shipyard began reporting with Intermediate Maintenance Facility (IMF) Bremerton Site and Naval Base Kitsap in 2004, which may also account for the increase in releases over time.

Status of DoD Component Reduction Plans

To measure progress towards reducing TRI releases, DoD requires Components to report the status of reduction plans to meet the E.O. 13148 goal.

Army

The Army will have difficulty achieving the DoD goal of a 40 percent TRI reduction by the end of 2006, based on the 2001 baseline. In recent years, the releases and transfers from many Army installations have increased due to a larger workload as a result of the Global War on Terrorism. Between 2001 and 2005, the Army's TRI releases have increased 9.97 percent. Specifically, the activities at Anniston Army Depot in support of the War on Terrorism are a major contributor, with an increase of 330,000 pounds from 2004 to 2005. Operations at Anniston Army Depot include repairing tracked vehicles and overhauling small arms. Water-dissociable nitrate compounds continue to be the majority of the Army's TRI releases. Radford Army Ammunition Plant, the Army's primary propellant manufacturer, decreased releases of waterdissociable nitrate compounds by 259,000 pounds. The Army reduced its overall nitrate compound releases through initiatives such as privatizing the wastewater treatment plant at Schofield Barracks and implementing pollution prevention initiatives on the process stream at Radford Army Ammunition Plant.

Navy

The Navy's previous success in achieving a 70 percent reduction in releases and off-site transfers between 1994 to 1999 has made it difficult to achieve

the current E.O. 13148 TRI reduction goal. Navy releases are driven by revised reporting guidance clarifications that include reporting releases from transient refueling and coincidental manufacturing. These releases accounted for roughly one-half of the Navy's 2005 TRI totals. Reducing coincidentally manufactured releases would require extensive investments in infrastructure. Unless these releases are significantly reduced or eliminated, the 2006 goal will be difficult to achieve. However, the Navy continues to work to reduce these releases. In July 2006, the Navy replaced the coal-fired heating plant at Naval Amphibious Base Little Creek with a natural gas plant that is projected to reduce annual releases by almost 300,000 pounds.

Marine Corps

The Marine Corps will have difficulty achieving the E.O. 13148 reduction goal. During the previous reduction period (1994 to 2000), the Marine Corps achieved over 90 percent reduction in releases and off-site transfers. In addition, over 24 percent of the Marine Corps installation 2001 baseline and 38 percent of the installation 2005 TRI releases and off-site transfers consist of releases of coincidentally manufactured nitrate compounds created during water and wastewater treatment. Reducing releases of nitrate compounds in water and wastewater systems requires extensive investment in infrastructure. In cases where compliance requirements dictate the reduction of nitrate compounds, the Marine Corps is doing so. Where releases currently comply with Clean Water Act permit requirements, further reductions are difficult to justify when there are other environmental compliance priorities.

The Marine Corps is making progress in reducing nitrates through compliance-driven projects. MCB Camp Pendleton recently completed construction of a new tertiary treatment plant, which is expected to significantly reduce nitrate compounds in the wastewater effluent. MCB Camp Pendleton nitrate releases represent nearly one-third of the total 2005 Marine Corps nitrate compound releases. The new plant began operating in the fall of 2006. A small reduction is expected during the 2006 reporting period and a significant reduction in nitrate levels is expected for the 2007 reporting period. Marine Corps Air Station Cherry Point recently awarded a biological nutrient removal project at the wastewater treatment plant. The project is scheduled for completion in 2008. This project will also reduce Marine Corps nitrate releases.

Air Force

The Air Force operates 77 major and 26 minor installations worldwide, covering approximately eight million acres. The Air Force employs 762, 012 active duty, civilian, Guard, and Reserve forces personnel while maintaining an industrial complex that sustains more than one hundred different weapon systems and components.

The Air Force sustains, restores, and modernizes its natural infrastructure to ensure operational capability, while maximizing the military value and optimizing the economical, ecological, and community value. Through targeted pollution prevention, weapon system recapitalization, and technology investment, the Air Force has achieved a 70 percent reduction in TRI releases since 1994. In addition, continued source reduction and pollution prevention efforts resulted in an 11 percent reduction of TRI releases in 2005 from 2004. Proactive management practices have been essential in these efforts, including the on-site reuse of off-specification jet fuel and the off-site transfer of fuel to a recycling facility.

In 2005, 71 percent of Air Force total TRI releases were placed primarily in one of three categories—copper and lead compounds from range operations; nitrate compounds from wastewater treatment; and hydrochloric acid, ethylene glycol, and dichloromethane from painting, deicing, and cleaning during industrial and flightline maintenance operations. Although wartime mission requirements are high, the Air Force continues to maintain stable or gradual reduction in TRI releases each year. Additional reductions in these categories will be challenging due to the mission-critical nature of these operations and the absence of suitable and safer substitutes. The Air Force will continue to invest in areas that will reduce TRI releases while ensuring combat capability.

DLA

In 2005, the Defense Logistics Agency (DLA) did not report any off-site transfers and reported very low TRI releases. The DoD Ozone Depleting Substance (ODS) Reserve operation at Richmond, VA, accounts for DLA's TRI releases. In 2001, the Richmond ODS reclaiming operation was shut down while it was moved to a modernized site. The subsequent loss of production in 2001 resulted in lower than normal TRI releases during the baseline year. TRI total releases are based on the Richmond ODS Reserve production levels; therefore, it is not anticipated that DLA will meet the 40 percent reduction goal during years when production levels are maintained. These products are required for important DoD weapons systems. The Richmond facility will continue to process ODS for more than 40 years, and it is unlikely that the reporting requirement will be eliminated. The new ODS facility at Richmond incorporates the most innovative technologies currently available for reclamation of ODS solvents and refrigerants.

DoD TRI Data

	Category	2001	2002	2003	2004	2005	2001 - 2005 % change
	On-site to Water	4,440,158	5,002,923	4,796,003	5,286,242	5,225,848	17.70%
Figure X-7	On-site to Air	3,022,163	2,825,150	3,107,041	2,188,518	2,183,607	-27.75%
Reportable Quantities,	On-site Underground Injection	0	0	0	0	0	-
CY2001 to CY2005	On-site Land	5,897,764	7,624,589	7,879,300	6,518,427	7,747,163	31.36%
(pounds released	Off-site to POTW	220,140	270,355	208,522	148,672	221,007	0.39%
or transterred)	Off-site Treatment	474,080	580,222	479,707	336,650	618,555	30.47%
	Off-site Disposal	988,849	1,051,985	1,098,065	640,445	651,428	-34.12%
	Total	15,043,155	17,355,224	17,568,637	15,118,954	16,647,609	10.67%
	Name of Chemical	2001	2002	2003	2004	2005	2001 - 2005 % change
	Nitrate Compounds	5,010,112	5,845,229	5,378,439	5,769,366	5,606,492	11.90%
Figure X-8	Copper	2,864,607	3,275,746	4,154,942	3,335,639	3,795,625	32.50%
Change Over Time	Lead Compounds	1,011,077	1,449,669	1,562,890	1,432,645	1,698,960	68.03%
of Top 10 DoD	Lead	976,690	1,143,543	1,340,277	1,019,091	1,122,994	14.98%
Chemicals Released	Aluminum (Fume or Dust)	948,188	633,764	438,460	325,005	382,249	-59.69%
and Transferred from CY2001 baseline	Hydrochloric Acid (1995 and after "Acid Aerosols" only)	854,013	648,271	738,877	453,569	342,039	-59.95%
(pounds released	Methyl Ethyl Ketone	469,204	530,798	418,684	Delisted	-	-
or transferred)	Zinc (Fume or Dust)	426,034	367,983	521,658	316,906	311,654	-26.85%
	Dichloromethane	386,483	391,782	437,515	322,197	479,107	23.97%
	Copper Compounds	207,014	627,995	224,494	166,867	232,643	12.38%
	Total	13,153,422	14,914,780	15,216,236	13,141,285	13,971,762	6.22%
	Name of Installation	2001	2002	2003	2004	2005	2001 - 2005 % change
	Radford Army Ammunition Plant	3,162,293	3,047,324	3,078,765	3,057,140	2,798,258	-11.51%
Figure X-9	Tinker AFB	479,956	293,605	314,686	110,287	126,941	-73.55%
Change in Top 10	Puget Sound Naval Shipyard	479,773	139,465	158,307	278,741	377,515	-21.31%
DoD Installations'	Sierra Army Depot	441,409	859	509	3,477	0	-100.00%
Releases and Transfers	Fort Wainwright	440,103	166,503	168,547	148,814	121,821	-72.32%
from CY2001 baseline	NAB Little Creek	365,135	271,569	278,476	269,395	261,688	-28.33%
(pounds released or	Pearl Harbor Naval Complex	359,220	460,229	371,644	294,092	517,958	44.19%
transferred)	Schofield Barracks/ Wheeler Army Airfield	326,667	420,317	312,930	115,489	0	-100.00%
	Nellis AFB Training Range	309,581	422,261	374,558	168,529	99,395	-67.89%
	Twentynine Palms Range	293,501	261,452	48,813	97,089	622,052	111.94%
	Total	6,657,638	5,483,584	5,107,235	4,543,053	4,925,628	-26.02%

Figure X-10 Top 10 CY2005 DoD TRI Chemicals

Name of Chemical	Pounds Released or Transferred
Nitrate Compounds	5,606,492
Copper	3,795,625
Lead Compounds	1,698,960
Lead	1,122,994
Dichloromethane	479,107
Aluminum (Fume or Dust)	382,249
Ethylene Glycol	373,216
Hydrochloric Acid (1995 and after "Acid Aerosols" only)	342,039
Zinc (Fume or Dust)	311,654
Xylene	268,356

Figure X-11 Top 10 CY2005 DoD Installations

Name of Installation	Pounds Released or Transferred
Radford Army Ammunition Plant	2,798,258
Anniston Army Depot	694,698
Twentynine Palms Range	622,052
Pearl Harbor Naval Complex	517,958
Marine Corps Base Camp Lejeune	504,922
Fort Bragg Range	459,717
Fort Sill DPW/EQD	454,457
Puget Sound Naval Shipyard	377,515
Fort Benning Range	371,939
Fort Bliss Air Defense Artillery Center & Ranges	360,820

Army TRI Data

Category	Category	2001	2002	2003	2004	2005	2001 - 2005 % change
E' V 10	On-site to Water	3,133,507	3,324,496	3,056,004	2,947,735	2,767,682	-11.67%
Figure X-12	On-site to Air	1,334,187	1,359,027	1,549,231	983,426	955,079	-28.41%
Army TRI Reportable Quantities,	On-site Underground Injection	0	0	0	0	0	-
CY2001 to CY2005	On-site Land	3,787,162	5,039,861	5,891,132	4,633,128	5,332,000	40.79%
(pounds released or transferred)	Off-site to POTW	7,420	67,026	25,971	22,636	24,363	228.35%
	Off-site Treatment	185,566	267,714	238,883	176,043	435,493	134.68%
	Off-site Disposal	438,124	746,166	718,296	261,622	257,454	-41.24%
	Total						9.97%

	Name of Chemical	2001	2002	2003	2004	2005	2001 - 2005 % change
	Nitrate Compounds	3,497,464	3,852,789	3,424,208	3,313,677	2,993,417	-14.41%
Figure X-13	Copper	1,722,224	2,018,669	3,366,557	2,512,897	2,778,154	61.31%
Change Over Time	Lead	679,642	974,454	1,145,886	848,093	907,180	33.48%
of Top 10 Army Chemicals Released and Transferred from	Aluminum (Fume or Dust)	665,824	633,764	161,087	97,170	104,485	-84.31%
	Hydrochloric Acid (1995 and after "Acid Aerosols" only)	634,263	426,860	490,432	226,661	157,735	-75.13%
CY2001 baseline	Lead Compounds	577,222	826,077	1,001,005	953,188	1,011,049	75.16%
(pounds released or transferred)	Methyl Ethyl Ketone	176,424	255,037	146,146	Delisted	-	-
	Copper Compounds	156,650	577,085	155,658	87,985	149,535	-4.54%
	Nitroglycerin	156,305	155,969	193,003	116,551	92,151	-41.04%
	Dichloromethane	122,015	152,265	178,612	94,668	297,753	144.03%

N	Name of Installation	2001	2002	2003	2004	2005	2001 - 2005 % change
	Radford Army Ammunition Plant	3,162,293	3,047,324	3,078,765	3,057,140	2,798,258	-11.51%
Figure X-14	Sierra Army Depot	441,409	859	509	3,477	0	-100.00%
Change in Top 10	Fort Wainwright	440,103	166,503	168,547	148,814	121,821	-72.32%
Army Installations' Releases and Transfers	Schofield Barracks/ Wheeler Army Airfield	326,667	420,285	312,930	115,489	0	-100.00%
from CY2001 baseline	Anniston Army Depot	283,462	719,241	557,770	365,832	694,698	145.08%
(pounds released or transferred)	Fort Hood Range	263,902	263,902	522,621	97,163	219,942	-16.66%
	Fort Benning Range	251,363	157,270	303,210	77,256	371,939	47.97%
	Fort Bragg Range	245,215	403,638	385,454	429,653	459,717	87.47%
	Holston AAP	235,302	269,214	254,538	107,588	139,956	-40.52%
	Red River Army Depot	216,679	147,981	95,730	88,870	126,458	-41.64%

Figure X-15 Top 10 CY2005 Army TRI Chemicals

Name of Chemical	Pounds Released or Transferred
Nitrate Compounds	2,993,417
Copper	2,778,154
Lead Compounds	1,011,049
Lead	907,180
Dichloromethane	297,753
Ethylene Glycol	158,296
Hydrochloric Acid (1995 and after "Acid Aerosols" only)	157,735
Copper Compounds	149,535
Formic Acid	129,454
Toluene	113,888

Figure X-16 Top 10 CY2005 Army Installations

Name of Installation	Pounds Released or Transferred
Radford Army Ammunition Plant	2,798,258
Anniston Army Depot	694,698
Fort Bragg Range	459,717
Fort Sill Field Artillery Range	454,457
Fort Benning Range	371,939
Fort Bliss Air Defense Artillery Center & Range	360,820
Fort Irwin National Training Center	250,475
Umatilla Chemical Depot	242,685
Fort Lewis Range	237,716
Fort Hood Range	219,942

Navy TRI Data

	Category	2001	2002	2003	2004	2005	2001 - 2005 % change
D' V 17	On-site to Water	891,271	882,194	899,992	966,038	1,104,761	23.95%
Figure X-17 Navy TRI Reportable Quantities,	On-site to Air	695,862	687,568	711,667	619,995	602,539	-13.41%
	On-site Underground Injection	0	0	0	0	0	-
CY2001 to CY2005	On-site Land	363,280	270,468	527,574	384,370	391,563	7.79%
(pounds released or transferred)	Off-site to POTW	950	1,316	837	17,949	111,237	11608.03%
	Off-site Treatment	184,477	133,229	63,775	88,949	103,241	-44.04%
	Off-site Disposal	379,994	166,035	245,211	260,942	267,072	-29.72%
	Total						2.57%

	Name of Chemical	2001	2002	2003	2004	2005	2001 - 2005 % change
	Nitrate Compounds	924,292	1,035,877	935,734	1,037,643	1,248,784	35.11%
Figure X-18	Copper	415,190	146,113	227,078	140,137	113,956	-72.55%
Change Over Time of	Zinc (Fume or Dust)	365,135	271,451	278,363	269,286	261,582	-28.36%
Top 10 Navy Chemicals	Lead	126,425	25,690	59,711	44,031	39,916	-68.43%
Keleased and Transferred	N-Butyl Alcohol	111,743	169,139	127,093	110,750	152,358	36.35%
from C12001 baseline	Ethylene Glycol	67,452	27,550	17,594	75,723	69,260	2.68%
(pounas reieasea or transferred)	Xylene (Mixed Isomers)	66,959	92,514	83,824	64,416	92,458	38.08%
	Ammonia	55,300	59,799	0	55,300	0	-100.00%
	N-Methyl-2-Pyrrolidone	51,660	21,200	4,133	9,254	12,658	-75.50%
	Copper Compounds	50,364	50,910	68,836	78,882	83,108	65.01%

	Name of Installation	2001	2002	2003	2004	2005	2001 - 2005 % change
	Puget Sound Naval Shipyard	479,773	139,465	158,307	278,741	377,515	-21.31%
Figure X-19	NAB Little Creek	365,135	271,569	278,476	269,395	261,688	-28.33%
Change in Top 10	Pearl Harbor Naval Complex	359,220	460,229	371,644	294,092	517,958	44.19%
Navy Installations	NSWC Crane Division	264,937	156,409	366,710	224,092	151,797	-42.70%
Keleases and Transfers	NAS Jacksonville	152,795	188,561	248,753	204,528	279,145	82.69%
from C12001 baseline	NAS Corpus Christi	151,660	115,496	116,238	219,093	83,879	-44.69%
(poulds released of transferred)	Norfolk Naval Shipyard	139,901	209,134	122,837	119,916	36,346	-74.02%
	COMNAVMARIANAS Guam	125,000	124,731	71,635	83,376	105,364	-15.71%
	NS Mayport	114,457	123,788	202,212	160,012	157,018	37.19%
	NAWS China Lake	89,018	60,480	63,203	67,725	31,053	-65.12%

Figure X-20 Top 10 CY2005 Navy TRI Chemicals

Name of Chemical	Pounds Released or Transferred
Nitrate Compounds	1,248,784
Aluminum (Fume or Dust)	277,764
Zinc (Fume or Dust)	261,582
N-Butyl Alcohol	152,358
Copper	113,956
Xylene (Mixed Isomers)	92,458
Copper Compounds	83,108
Ethylene Glycol	69,260
Zinc Compounds	53,140
N-Hexane	41,865

Figure X-21 Top 10 CY2005 Navy Installations

Name of Installation	Pounds Released or Transferred
Pearl Harbor Naval Complex	517,958
Puget Sound Naval Shipyard	377,515
NAS Jacksonville	279,145
NAB Little Creek	261,688
NS Mayport	157,018
NSWC Crane Division	151,797
NAS Fallon, Bravo 17	129,561
NAS Point Mugu - Naval Base Ventura County	110,010
COMNAVMARIANAS Guam	105,364
NAS Corpus Christi	83,879

Marine Corps TRI Data

	Category	2001	2002	2003	2004	2005	2001 - 2005 % change
	On-site to Water	338,784	652,454	740,369	1,222,170	1,085,463	220.40%
	On-site to Air	132,920	133,359	181,456	144,964	106,324	-20.01%
ities,	On-site Underground Injection	0	0	0	0	0	-
005	On-site Land	885,236	1,244,632	708,330	847,149	1,586,864	79.26%
d	Off-site to POTW	48	0	0	0	0	-100.00%
)	Off-site Treatment	7,291	7,416	30,914	0	6,247	-14.32%
	Off-site Disposal	46,376	9,273	11,011	1,046	75,857	63.57%
	Total						102.80%

Figure X-22

Marine Corps Reportable Quant CY2001 to CY20 (pounds release or transferred

	Name of Chemical	2001	2002	2003	2004	2005	2001 - 2005 % change
	Copper	452,758	826,495	314,313	433,950	686,577	51.64%
Figure X-23	Lead Compounds	370,284	348,540	337,341	365,011	636,115	71.79%
Change Over lime of	Nitrate Compounds	338,793	654,266	742,095	1,230,239	1,087,207	220.91%
Top 10 Marine Corps Chemicals Released and Transferred from	Lead	111,662	62,266	68,924	42,982	112,852	1.07%
	Hydrochloric Acid (1995 and after "Acid Aerosols" only)	65,740	62,406	103,819	55,390	0	-100.00%
CY2001 baseline	Methyl Ethyl Ketone	28,087	27,770	30,444	Delisted	-	-
(pounds released or transferred)	Dichloromethane	19,741	20,395	14,370	20,018	16,770	-15.05%
	Toluene	11,901	12,763	11,878	40,972	38,977	227.51%
	Ethylene Glycol	7,506	6,772	30,292	71	506	-93.26%
	Xylene (Mixed Isomers)	3,792	2,819	1,000	3,940	20,783	448.07%

2001 - 2005 Name of Installation 2001 2002 2003 2004 2005 % change **Twentynine Palms Range** 293,501 261,452 48,813 97,089 622,052 Figure X-24 **Camp Pendleton Range** 237,607 188,052 138,740 150,165 302,750 Change in Top Marine Corps Base 212,219 225,179 230,068 719,992 504,922 Camp Lejeune 10 Marine Corps Installations' Releases and Camp Pendleton 203,810 254,585 344,959 309,485 300,586 Transfers from CY2001 **Quantico Range Complex** 108,000 116,919 118,256 94,941 146,343 baseline Camp Lejeune Range 84,398 175,760 195,382 332,892 306,153 (pounds released or Parris Island Range 72.575 77,882 67.402 77.511 78,556 transferred) **MCAS Cherry Point** 49,787 107,223 169,042 89,537 78,281 48,200 6,200 10,673 10,480 3,270 **Puuloa Training Facility Camp Billy Machen** 46,270 0 47,627 0 0 -100.00% **Gunnery Range**

Figure X-25 Top 10 CY2005 Marine Corps TRI Chemicals

Name of Chemical	Pounds Released or Transferred
Nitrate Compounds	1,087,207
Copper	686,577
Lead Compounds	636,115
Lead	112,852
Nitroglycerin	91,140
Dinitrotoluene (Mixed Isomers)	53,067
Phosphorus (Yellow or White)	48,775
Toluene	38,977
Dibutyl Phthalate	36,269
Xylene (Mixed Isomers)	20,783

Figure X-26 Top 10 CY2005 Marine Corps Installations

Name of Installation	Pounds Released or Transferred
Twentynine Palms Range	622,052
Marine Corps Base Camp Lejeune	504,922
Camp Lejeune Range	306,153
Camp Pendleton Range	302,750
Camp Pendleton	300,586
Quantico Range Complex	146,343
MCB Quantico	144,069
Recruit Depot Parris Island (DEPOT)	84,469
MCAS Cherry Point Range	78,575
MCAS Cherry Point	78,281

111.94%

27.42%

137.92%

47.48%

35.50%

262.75%

15.55%

57.23%

-93.22%

Air Force TRI Data

	Category	2001	2002	2003	2004	2005	2001 - 2005 % change
07	On-site to Water	76,596	143,779	99,607	150,299	267,942	249.81%
27 DI	On-site to Air	903,420	640,405	659,105	514,921	517,098	-42.76%
ntities,	On-site Underground Injection	0	0	0	0	0	-
2005	On-site Land	862,788	1,917,706	752,263	653,780	436,736	-49.38%
ised	Off-site to POTW	211,722	220,171	181,712	108,087	85,407	-59.66%
ed)	Off-site Treatment	96,746	54,221	146,125	71,658	73,574	-23.95%
	Off-site Disposal	124,355	277,749	123,548	116,835	51,045	-58.95%
	Total						-37.08%

Figure X-2

Air Force T Reportable Qua CY2001 to CY (pounds relea or transferre

	Name of Chemical	2001	2002	2003	2004	2005	2001 - 2005 % change
	Copper	274,435	309,513	246,994	248,655	216,938	-20.95%
Figure X-28	Aluminum (Fume or Dust)	271,464	0	0	12,335	0	-100.00%
Change Over Time	Nitrate Compounds	249,563	302,297	276,402	187,807	277,084	11.03%
of Top IV Air Force	Methyl Ethyl Ketone	221,491	211,474	196,010	Delisted	-	-
Transferred from (Y200)	Dichloromethane	208,825	208,745	207,093	181,578	143,327	-31.37%
baseline	Barium	197,364	137,000	115,000	122,000	0	-100.00%
(pounds released or transferred)	Hydrochloric Acid (1995 and after "Acid Aerosols" only)	154,010	159,005	144,626	171,518	184,304	19.67%
	Glycol Ethers	114,250	18,215	15,139	15,641	16,954	-85.16%
	Ethylene Glycol	108,586	88,166	117,303	104,454	145,154	33.68%
	Phenol	95,780	48,131	53,312	35,123	36,462	-61.93%

2001 - 2005 Name of Installation 2001 2002 2003 2004 2005 % change **Tinker AFB** 479,956 193,605 314,686 110,287 126,941 -73.55% **Nellis AFB Training Range** 309,581 422,261 374,558 168,529 99,395 -67.89% Figure X-29 Change in Top 10 Hill AFB (Ogden ALC) 332,612 260,588 336,373 272,605 243,118 -6.70% Air Force Installations' Eielson AFB 226,152 213,902 155,080 164,612 0 -100.00% Releases and Transfers Robins AFB 220,351 176,146 140,921 105,403 101,439 -53.96% from CY2001 baseline Barry M. Goldwater 171,312 20,372 20,832 21,080 26,731 -84.40% Range/Luke AFB (pounds released or transferred) Air Force Plant No. 4 145,868 166,998 177,836 124,877 116,334 -20.25% Eglin AFB Range 129,333 80,761 17,386 120,131 113,871 -11.95% Wright-Patterson AFB 95,623 87,015 92,639 120,058 94,013 -1.68% Air Force Plant No. 6 65,481 47,360 50,977 56,119 168,105 156.72%

Figure X-30 Top 10 CY2005 Air Force TRI Chemicals

Name of Chemical	Pounds Released or Transferred
Nitrate Compounds	277,084
Copper	216,938
Hydrochloric Acid (1995 and after "Acid Aerosols" only)	184,304
Ethylene Glycol	145,154
Dichloromethane	143,327
Toluene	81,664
Tetrachloroethylene	66,803
Lead	63,047
Xylene (Mixed Isomers)	50,071
Lead Compounds	43,810

Figure X-31 Top 10 CY2005 Air Force Installations

Name of Installation	Pounds Released or Transferred
Hill AFB (Ogden ALC)	243,118
Air Force Plant No. 6	168,105
Tinker AFB	126,941
Air Force Plant No. 4	116,334
Eglin AFB Range	113,871
Robins AFB	101,439
Nellis AFB Training Range	99,395
Wright-Patterson AFB	94,013
Arnold AFB	90,501
UTTR - Demilitarization Activities	90,299

DLA TRI Data

	Category	2001	2002	2003	2004	2005	2001 - 2005 % change
Figure X-32	On-site to Water	0	0	0	0	0	-
DLA TRI Reportable	On-site to Air	869	4,791	5,084	3,790	2,568	195.51%
Quantities, CY2001 to CY2005 (pounds released or transferred)	On-site Underground Injection	0	0	0	0	0	-
	On-site Land	0	0	0	0	0	-
	Off-site to POTW	0	0	0	0	0	-
	Off-site Treatment	0	0	0	0	0	-
	Off-site Disposal	0	0	0	0	0	-
	Total						195.51%

Figure X-35					
Top 10 CY2005 DLA TRI Chemicals					

Name of Chemical	Pounds Released or Transferred
Bromotrifluoromethane	976
Bromochlorodifluoromethane	592
Dichlorotetrafluoroethane	511
Dichlorodifluoromethane (CFC-12)	382
Trichlorofluoromethane	107
Polycyclic Aromatic Compounds	0.015
Benzo(g,h,i)perylene	0.002

Figure X-36 Top 10 CY2005 DLA Installations

Name of Installation	Pounds Released or Transferred
Defense General Supply Center Richmond	2,568
Defense Distribution Depot Susquehanna	0.017

Figure X-33 Change Over Time of Top 10 DoD Chemicals Released and Transferred from CY2001 baseline (pounds released or transferred)	Name of Chemical	2001	2002	2003	2004	2005	2001 - 2005 % change
	Bromotrifluoromethane	471	1,867	3,156	691	976	107.22%
	Dichlorodifluoromethane (CFC-12)	220	1,562	726	613	382	73.64%
	Bromochlorodifluoromethane	80	0	0	1,362	592	640.00%
	Dichlorotetrafluoroethane	55	1,362	1,202	991	511	829.09%
	Trichlorofluoromethane	43	0	0	133	107	148.84%

Figure X-34 Change in Top 10	Name of Installation	2001	2002	2003	2004	2005	2001 - 2005 % change
DLA Installations' Releases and Transfers from CY2001 baseline (pounds released or transferred)	Defense General Supply Center, Richmond	869	4,791	5,084	3,790	2,568	195.51%