

# Underground Storage Tank Removal Procedure & Checklist

## 1.0 GENERAL

Site Number or Name	
Location	▼
Outsource Service Provider (OSP) or Construction Manager (CM)	
General Contractor (GC) Name	
Tank Removal Contractor (TRC) Name	
Job Number	
Work Order Number	
Project Start date	
Project Completion date	

**INSTRUCTIONS:** Outsource Service Provider (OSP) or Construction Manager (CM) and General Contractor (GC) to initial and date items upon completion. Any items on the list that are not applicable should be marked N/A. Original document should be kept on site. Note this is not an exhaustive list, but rather highlights specific milestones throughout a project. The GC is responsible to adhere to the approved plans and specifications. Any deviation must be first approved by the CM and or Construction Project Coordinator. [Note: for Environmental Services (ES) projects, the CM is usually the Environmental Consultant and the TRC is usually the GC].

Tank inerting / degassing, cleaning and removal is a complex job that involves various higher risk activities. It must be executed by qualified and experienced personnel. TRC shall ensure compliance with all applicable safety regulations (i.e. U.S.A. - OSHA) and all applicable permits and regulations, including these procedures and contract requirements. American Petroleum Institute (API) Recommended Practice 1604 (Closure of Underground Petroleum Storage Tanks) shall be used as a primary reference.

## 2.0 HEALTH AND SAFETY

		CM / Date	GC / Date
2.1	All required permits are in hand.		
2.2	Pre-Construction Safety Meeting has been completed.		
2.3	Daily Site Safety Meetings are held		
2.4	Emergency Response Procedures on site and have been reviewed.		
2.5	Site security measures (fence, barricades, etc.) have been installed.		
2.6	All applicable safety forms, as identified by the designated representative on site.		
2.7	Qualified, safety-certified person(s) required on site have been determined (In addition, some jurisdictions require an individual on site who is certified for tank closure work.		
2.8	A Health & Safety Plan (HASP) and all appropriate JSAs are on site.		
2.9	Combustible gas indicators and other vapor analyzers are properly calibrated and remain on site at all times during tank removal. TRC (tank removal contractor) must be able to provide combustible gas indicator and analyzer calibration records as required.		
2.10	A Hot Work Permit is on site, adhered to and modified as warranted by site conditions.		
2.11	The Fire Department and other agencies have been notified, as required.		
2.12	All arc-producing operations are isolated, grounded and bonded as appropriate to prevent fire and or explosions.		
2.13	On site fire protection capable of covering the excavation area has been provided; a minimum of two (2) 20# ABC fire extinguishers are required.		
2.14	An off-site meeting area has been established in case the site must be evacuated for any reason.		
2.15	A procedure for keeping waste and construction debris stockpiled (general housekeeping) has been established.		

## 3.0 WORK PROCESS

		CM / Date	GC / Date
3.1	GC is responsible for the requirements outlined in the "Request for Proposal."		
3.2	GC is responsible for all site work unless work responsibility is specifically assigned to others.		
3.3	GC shall daily verify that all appropriate utilities are disconnected, locked and tagged out before initiating site work.		
3.4	Depth to groundwater (water table) in the tank excavation area must be determined before construction begin and action plans developed as necessary.		

**DUE TO EXTREMELY HAZARDOUS POTENTIAL, NO PERSONNEL SHALL ENTER A TANK REGARDLESS IF THE TANK HAS OR HAS NOT CONTAINED HYDROCARBONS.**

## 4.0 WASTE MANAGEMENT PLAN

		CM / Date	GC / Date
4.1	A site-specific Waste Management Plan (WMP) is on site and is being followed.		
4.2	The WMP includes disposition or treatment plan for all anticipated wastes		
4.3	The WMP includes a plan for managing waste manifests		

4.4	Stockpile locations and stockpile berm design for impacted materials (soil, gravel, debris impacted with used oil, gasoline, diesel, hydraulic oil, etc.) have been determined.		
4.5	The WMP includes waste minimization & segregation plans, which should specify plans for reuse of materials on site, if allowed.		
4.6	Acceptance of a waste profile through the planned disposal facility for any product used for tank cleaning (for example, Mirachem 500, BioSolve, etc.).		

<b>5.0 TANK AND PIPING REMOVAL PREPARATION</b>	CM / Date	GC / Date
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**EXCAVATION WORK SHALL NOT COMMENCE UNTIL EXXONMOBIL'S REMEDIATION CONSULTANT IS ON SITE. IN ADDITION, SOME REGULATIONS OR AUTHORITIES MAY REQUIRE THAT AN INDIVIDUAL CERTIFIED FOR TANK CLOSURE WORK BE ON SITE TO COORDINATE THE CLOSURE WORK. IN THIS CASE, CLOSURE WORK MUST NOT COMMENCE UNTIL BOTH THE CERTIFIED INDIVIDUAL AND THE REMEDIATION CONSULTANT ARE ON SITE.**

5.1	All spark producing or heat generating equipment not certified explosion-proof must be located a minimum distance of 50 feet (15m) away from the tank system until the tank system is verified to be inerted or degassed. Note: Where the 50 foot (15m) minimum cannot be maintained, alternative measures must be defined in the Hot Work permit to isolate the equipment of concern, or mitigate vapor migration. Examples include fire-watch specific to the equipment, wetting down source areas, erecting a vapor barrier fence at the source area.		
5.2	No spark producing equipment, work or heat generating source (i.e. catalytic converter) is allowed in the Hot Work Permit area [50 feet (15m)] during tank system inerting or degassing.		
5.3	Remove all vent caps from all tank vent risers.		
5.4	Drain product from piping system into tank by removing STP check valve and opening safety (shear) valve test ports at each dispenser island. (For suction systems, open the piping at each pump; also remove foot valve at tank if applicable).		
5.5	Beginning at the furthest point from the tank, purge the product piping by applying Nitrogen [5 psi (0.3bar) maximum] (or flushing with water if nitrogen is not readily available) at each shear valve test port (pump inlet for suction systems) , at each dispenser island, to ensure as much product as possible is drained into the tank. The tank vent must be operational during this process.		

**DO NOT PURGE PIPING WITH COMPRESSED AIR. CAUTION: WHEN APPLYING NITROGEN, ENSURE PROPER ELECTRICAL GROUNDING AND BONDING.**

5.6	Beginning at the furthest point from the tankfield, apply the appropriate wash solution* at each shear valve test port (suction pump inlet for suction systems), at each dispenser island, to ensure a triple rinse of the piping volume and allow the liquid to drain into the tanks. For pressure systems, disconnect the STP union/swivel and transfer any residual liquid from the piping in the tank. All tank vents must be operational during this process. * Based on the type of tank system and its contents, and the availability of detergents such as Mirachem or Simple Green, the TRC will specify the appropriate water and detergent solution and its temperature.		
5.7	If approved, certain piping to be permanently abandoned in place (e.g. under an existing building), flush with the appropriate wash solution* to ensure a triple rinse of the piping volume. Vacuum and manage solution per WMP. Fill line with sand and cement slurry, or equivalent.		
5.8	Remove remaining liquids from all tanks using a vacuum truck in lieu of on-site storage containers. Alternatively an air driven pump may be used. Manage this material per the WMP. Document the residual liquid removal process.		

**DO NOT POUR RESIDUAL GASOLINE OR DIESEL FUEL INTO THE USED OIL TANK OR THE OIL WATER SEPARATOR.**

<b>6.0 PIPING REMOVAL</b>	CM / Date	GC / Date
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6.1	Break concrete and excavate down to expose piping (this work can be scheduled around the tank removal).		
6.2	Remove all product primary and secondary piping by excavation. Ensure all product has been removed from tanks and piping prior to removing piping. Extreme care should be exercised in this activity using appropriate materials to contain any liquids encountered.		
6.3	Remove all vent piping by excavation. Tanks must continue to be vented at a minimum of 12 feet above grade; temporary vents must be installed before removing the vent piping. Note: depending on site conditions, existing vent piping may be used during tank inerting / degassing and removed afterwards.		
6.4	Remove all vapor recovery piping and any associated condensate pots.		
6.5	Remove all remote fill piping (if applicable).		
6.6	Remove all dispenser containment sumps, shear valves, and flexible piping connectors, and properly dispose.		
6.7	If unexpected/additional piping is encountered (product, vent, vapor, etc.), it should be removed (or properly abandoned in place if approved).		

7.0 TANK INERTING / DEGASSING		CM / Date	GC / Date
7.1	Ensure the tank vents are operational during this process. If the existing vent stacks are utilized, the vent stack caps must be removed before degassing or inerting the tank.		
7.2	TRC must ensure each tank is vapor free, to less than 10% of the lower explosion limit (LEL) or 5% oxygen content using methods described in API 1604 (excluding purging with steam). The preferred method is inerting by adding solid carbon dioxide (dry ice) to the tank in the amount of at least 1.5 pounds (0.68 kg) per 100 gallons (387 L) of the tank's capacity. An alternate method is to purge the tank using an educator [an eductor extension shall be used to discharge vapors a minimum of 12 feet (3.7m) above grade]. Certain site conditions or stagnant weather may require the vents to be remotely located. Filling the tank completely with water is acceptable only if approved. Note: Water disposal should be covered in the WMP. Do not degas tank with steam due to the possibility of static electricity build-up and discharge.		
7.3	TRC must measure hydrocarbon vapor levels around the tankfield surface throughout the inerting or degassing process. Additionally, tank vapor concentration measurements should be taken through all available risers, and measured at the top, middle and bottom of each tank.		
7.4	TRC must ensure the degassing equipment (if used) is properly grounded and bonded.		
7.5	The inerting / degassing process should be completed before the tankfield pad is removed. A change in the order of activities in these procedures must be preapproved.		
7.6	Regularly check low spots around the tanks for vapor accumulations (ditches, excavations, manholes, drainage etc.) during the degassing or inerting process.		

8.0 TANK WASHING		CM / Date	GC / Date
8.1	The tank washing must be completed after inerting / degassing the tank and should be completed before the tank field pad is removed.		
8.2	Ensure pressure wash apparatus is properly grounded and bonded to reduce the potential for static discharge.		
8.3	Use of a multidirectional pressure spray nozzle or a spray wand having a 90 degree bend at the tip is recommended.		
8.4	Triple rinse tank using the appropriate wash solution.* Tank cleaning must be performed before excavation begins. Additional cleaning may need to be performed above ground as required to certify tank as clean.		
8.5	Prior to cleaning a fuel oil, waste oil, or diesel tank, determine the appropriate wash solution.* These tanks may need the appropriate wash solution to remain in the tank for a longer time period.		
8.6	Vacuum and manage all liquid after each rinse per the WMP.		
8.7	TRC (or other party as required by local regulatory agency) must certify all tanks clean while tanks are on site.		

9.0 EXCAVATE TO THE TOP OF THE TANK		CM / Date	GC / Date
9.1	If conditions differ from the initial conditions used to develop the WMP, contact <b>designated representative to discuss proper disposition of wastes.</b>		
9.2	Excavated backfill should be reused on site or disposed of per the WMP. Separate construction debris (e.g. concrete, piping, etc.) from excavated soil and/or gravel. (Note: if new tanks are to be installed to replace the tanks being removed, certified backfill is required; excavated backfill should not be used to set the new tanks).		
9.3	Manage all excavated materials per the WMP. Note: As a minimum, all stockpiled material (excluding construction debris) must be placed on an impervious surface, bermed, and covered with an impervious material. Stockpiles shall be located a safe distance from excavations.		

**WALKING ON TOP OF AN EXPOSED TANK SHOULD BE AVOIDED WHENEVER POSSIBLE. ALL SAFE ALTERNATIVES SHOULD BE REVIEWED BEFORE DETERMINING THAT A WORKER MUST WALK ON TOP OF AN EXPOSED UST. IF A WORKER MUST WALK ON TOP OF AN EXPOSED TANK, A JSA MUST BE DEVELOPED FOR ANY WORK THAT INVOLVES WALKING ON TOP OF THE EXPOSED UST AND MUST BE REVIEWED BY EXXONMOBIL, OR DESIGNATED REPRESENTATIVE. THE BACKFILL AROUND THE TANK SHOULD BE USED AS THE WALK/WORK SURFACE FOR MOST OF THE WORK ON TOP OF TANK. IT IS RECOGNIZED THAT AT TIMES IT MAY BE NECESSARY TO WORK ON TOP OF TANKS; HOWEVER SAFETY DEVICES SUCH AS WALK-WAYS WITH HANDRAILS, MAN LIFTS, HARNESSSES, OR OTHER DEVICES, SHOULD BE USED WHEN POSSIBLE TO MINIMIZE THE RISK TO PERSONNEL. THE USE OF THESE DEVICES AND THE WORK ON TOP OF THE TANK MUST BE APPROVED IN ADVANCE BY DESIGNATED REPRESENTATIVE.**

**NO PERSON SHALL BE AUTHORIZED TO ENTER A TANK EXCAVATION AREA UNTIL THE TRC AND DESIGNED REPRESENTATIVE HAVE VERIFIED THAT IT IS SAFE TO DO SO. THIS VERIFICATION MAY INCLUDE EVALUATION OF THE EXCAVATION BY THE CERTIFIED PERSON AS NECESSARY, AND VERIFICATION THAT ANY HYDROCARBON VAPORS ARE LESS THAN 10% OF THE LOWER EXPLOSION LIMIT (LEL), AS DETERMINED BY A COMBUSTIBLE GAS INDICATOR (CGI). (U.S.A. NOTE: SPECIFIC OSHA REGULATIONS APPLY TO EXCAVATIONS, INCLUDING OSHA 1910 AND 1926).**

9.4	Remove all tank appurtenances, and plug all tank openings with the exception of the tank vent port. Ensure the tank is properly vented at all times.		
9.5	Remove or disconnect all electrical conduits connected to the tank.		

<b>10.0 TANK REMOVAL AND DISPOSAL</b>		CM / Date	GC / Date
10.1	TRC must ensure the tank is vapor free - to less than 10% of the lower explosion limit (LEL). See "7.0 TANK INERTING / DEGASSING" section above for more details.		
10.2	TRC is to ensure that the lifting equipment and any associated attachments provided or selected for use are rated for the load and lift conditions. TRC to ensure all applicable guidelines, as well as local requirements for lifting are followed. Lifting lugs on tank need to be inspected to ensure they are still adequate (lifting eyes may be used as well).		
10.3	Release the tank's deadman straps (if applicable).		
10.4	Excavate surrounding backfill to a depth sufficient to remove tank intact. Remove tank from the excavation and place it in a secure location. Chock the tank to prevent movement. Note: deadman anchors, if present, are not to be removed from tankfield unless required by regulations or to facilitate new tank installation or remediation as directed by EMES.		
10.5	Remove all gravel/soil/debris from the tank's exterior.		
10.6	Environmental Consultant shall inspect tanks and open excavation for evidence of a hydrocarbon release.		
10.7	Only fiberglass tanks may be crushed on site. Precautions may be required to minimize damage from airborne pieces of fiberglass and/or inhalation of airborne particles.		
10.8	GC shall determine if tanks are ready for disposal.		
10.9	Tanks should be transported in accordance with all applicable regulations. The transport truck's trailer bed should exceed the length of the tank. The tank must be strapped to the truck bed to prevent movement.		
10.10	Ensure tanks are degassed or inerted prior to transporting tanks from site. Vent each tank with at least one 1/8 inch (3 mm) hole.		
10.11	Prior to transporting tanks from site, legibly label each tank as follows: TANK HAS CONTAINED FLAMMABLE LIQUIDS AND/OR PETROLEUM HYDROCARBONS. NOT GAS FREE, NOT SUITABLE FOR FOOD OR DRINKING WATER.		
10.12	Immediately prior to transporting the tank, GC must ensure the tank is vapor free, to less than 10% of the LEL.		

<b>11.0 BACKFILL APPLICATION</b>		CM / Date	GC / Date
11.1	Unless specified elsewhere, and where allowed and practical to do so, use the excavated soil and/or gravel as backfill material, unless a new tank is being installed in the tankfield, or otherwise directed by EMES.		
11.2	If excavated soil cannot be reused, use imported clean fill to backfill the excavation.		
11.3	Fill materials shall be compacted to, at a minimum, 90% of the optimum density based on Standard Proctor Compaction tests. ExxonMobil reserves the right to have soil tests performed to confirm the compaction density.		
11.4	Cover disturbed areas with approximately 6 inches of compacted aggregate.		

<b>12.0 REMOVAL &amp; DISPOSAL OF LIFTS</b>		CM / Date	GC / Date
12.1	Evacuate hydraulic fluid from reservoir and cylinder.		
12.2	Drain reservoir and cylinder before removal.		
12.3	Break concrete and excavate around cylinder.		
12.4	Remove reservoir and lifts, and place on an impervious surface until removed from site.		
12.3	Remediation Consultant must verify extent of excavation.		
12.4	Manage hydraulic fluid and excavated materials per WMP.		
12.5	Prepare lifts, reservoirs, piping, and lift cylinders for disposal. Wash as described in Section 5.7 as required.		
12.6	Utilize excavated materials as backfill where allowed and practical, completing the backfill application with imported clean fill.		

<b>13.0 REMOVAL &amp; DISPOSITION OF OIL WATER SEPARATORS (OWS)</b>		CM / Date	GC / Date
13.1	Evacuate fluids from the OWS.		
13.2	Wash influent lines as described in Section 5.7. If lines are to be abandoned in place, follow guidance in Section 5.7.		
13.3	Wash OWS per tank wash procedures as described above.		
13.4	Remove or close OWS in place as directed.		