No. 20-2086

IN THE
United States Court of Appeals for the Federal Circuit

MILITARY-VETERANS ADVOCACY INC.,

Petitioner,

v.

SECRETARY OF VETERANS AFFAIRS,

Respondent.

On Petition for Review Pursuant to 38 U.S.C. § 502

OPENING BRIEF OF PETITIONER

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UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

CERTIFICATE OF INTEREST

Case Number 2020-2086

Short Case Caption Military-Veterans Advocacy Inc. v. Secretary of Veterans Affairs

Filing Party/Entity Military-Veterans Advocacy Inc.

Instructions: Complete each section of the form. In answering items 2 and 3, be specific as to which represented entities the answers apply; lack of specificity may result in non-compliance. **Please enter only one item per box; attach additional pages as needed and check the relevant box**. Counsel must immediately file an amended Certificate of Interest if information changes. Fed. Cir. R. 47.4(b).

I certify the following information and any attached sheets are accurate and complete to the best of my knowledge.

Date: 04/15/2021

Signature: /s/ James Anglin Flynn

Name: James Anglin Flynn

1. Represented Entities. Fed. Cir. R. 47.4(a)(1).	**2. Real Party in Interest.** Fed. Cir. R. 47.4(a)(2).	**3. Parent Corporations and Stockholders.** Fed. Cir. R. 47.4(a)(3).
Provide the full names of all entities represented by undersigned counsel in this case.	Provide the full names of all real parties in interest for the entities. Do not list the real parties if they are the same as the entities. ☑ None/Not Applicable	Provide the full names of all parent corporations for the entities and all publicly held companies that own 10% or more stock in the entities. ☑ None/Not Applicable
Military-Veterans Advocacy Inc.		

☐ Additional pages attached

4. Legal Representatives. List all law firms, partners, and associates that (a) appeared for the entities in the originating court or agency or (b) are expected to appear in this court for the entities. Do not include those who have already entered an appearance in this court. Fed. Cir. R. 47.4(a)(4).

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5. Related Cases. Provide the case titles and numbers of any case known to be pending in this court or any other court or agency that will directly affect or be directly affected by this court's decision in the pending appeal. Do not include the originating case number(s) for this case. Fed. Cir. R. 47.4(a)(5). See also Fed. Cir. R. 47.5(b).

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6. Organizational Victims and Bankruptcy Cases. Provide any information required under Fed. R. App. P. 26.1(b) (organizational victims in criminal cases) and 26.1(c) (bankruptcy case debtors and trustees). Fed. Cir. R. 47.4(a)(6).

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STATEMENT OF RELATED CASES

No appeal in or from the same proceeding before the Department of Veterans Affairs has previously been before this or any other appellate court.

Military-Veterans Advocacy and its counsel are unaware of any cases pending in this or any other court that will directly affect or be affected by this Court's decision in this case. As explained below, *see infra* p. 23, counsel are aware that the claims of MVA members—and many other veterans—are or may be pending before the Department of Veterans Affairs and present the same or similar legal issues, including the proper construction of the Agent Orange Act of 1991, *see* Fed. Cir. R. 47.5(b) & practice note.

INTRODUCTION

This petition calls for the Court again to enforce the commitments our government made to the nation's veterans in the Agent Orange Act of 1991. At that time, Congress established a factual presumption of herbicide exposure for veterans' claims arising from the use of toxic herbicides in Vietnam. Record-keeping on toxic herbicides was poor, their use was widespread, and their harmful effects were often not evident for decades. As a result, conclusive individual proof of exposure to herbicides in Vietnam was and remains rare, but the proof of collective exposure is undeniable.

American use of toxic herbicides in the Vietnam War was not constrained by Vietnam's borders. Toxic herbicides, including Agent Orange itself, were stored and sprayed around American military installations on Guam and Johnston Island, exposing veterans who served there, too. But without the Agent Orange Act's presumption of exposure, these veterans routinely lose their benefits claims, for reasons that are unfortunately predictable. For example, the Board of Veterans Appeals often does not credit veterans' own accounts of their exposure to herbicides, because the veterans lack specialized chemical training.

This is true even when veterans produce corroborating proof, like photographs of themselves with labeled herbicide-storage drums. *E.g.*, *Fleener v. Shinseki*, No. 11-3489, 2013 WL 425346, at *4 (Vet. App. Feb. 5, 2013).

Based on eyewitness accounts of exposure from individual veterans—as well as contemporaneous records, government reports, and soil testing data—Military-Veterans Advocacy Inc. (MVA) petitioned the Secretary of Veterans Affairs (VA) for rulemaking to recognize a presumption of exposure for these Vietnam-era veterans who served on Guam and Johnston Island.

In denying MVA's petition, VA committed two fundamental errors. First, VA imposed a narrow restriction on the Agent Orange Act's definition of covered "herbicide agents," limiting its reach to so-called tactical herbicides as opposed to commercial herbicides. That restriction is without a textual basis in the statute or its legislative history; instead, it impermissibly renders a key statutory term surplusage.

Second, in applying that misinterpretation, VA concluded that there was no exposure to tactical herbicides on the islands in question.

In reaching that mistaken conclusion, VA misconstrued the historical record: It relied on the absence of records as evidence for an issue on which the government did not even keep records, and it discarded veterans' eyewitness accounts for irrational reasons that amount to no reason at all. Those accounts are corroborated by decades of evidence establishing the presence of toxic herbicides, both "tactical" and "commercial," in Guam and Johnston Island. VA's conclusion that there was categorically no evidence of tactical herbicides lacks any basis in this record.

Each of these errors independently warrants vacatur of the denial of MVA's petition and remand for the Secretary to conduct rulemaking, under the proper interpretation of the statute and considering all the evidence.

JURISDICTIONAL STATEMENT

MVA petitioned VA for rulemaking pursuant to 5 U.S.C. § 553(e). Appx10-12. VA denied the petition on May 12, 2020. Appx2143-2148. MVA timely petitioned for review in this Court on July 10, 2020. *See* ECF No. 1-2; 28 U.S.C. § 2401(a); Fed. Cir. R. 15(f)(1) (as amended Jan. 31, 2021). Following a voluntary remand, ECF No. 16, this Court

reinstated MVA's petition on March 16, 2021, ECF No. 19. This Court has jurisdiction to review the Secretary's denial pursuant to 38 U.S.C. § 502.

STATEMENT OF THE ISSUES

1. Was the Secretary's denial of MVA's petition contrary to law, where it was premised on an interpretation of the Agent Orange Act that is contrary to the statute's text, purpose, and history, as well as VA's own regulation?

2. Was the Secretary's denial of MVA's petition arbitrary and capricious, where it lacked a factual basis in the record and baselessly discounted veterans' eyewitness accounts?

STATEMENT OF THE CASE

The U.S. Military Made Widespread Use of Toxic Herbicides In The Vietnam War at Scales Large and Small

The United States deployed roughly 20 million gallons of herbicides in the period from 1962 to 1971. Appx2576. The most notorious of these, Agent Orange, accounted for roughly 11 million gallons. Appx2580. When sprayed on enemy territory, the herbicides were used for the "defoliation of trees and plants to improve visibility for military operations" and for the "destruction of essential enemy food

supplies." Appx2576. The defoliation campaign "improved aerial observation, opened roads to free travel, and hindered enemy ambush." Appx2576. Nearly ten percent of South Vietnam was sprayed, much of it repeatedly. Appx2591-2595.

But by the end of the 1960s, legal and ethical controversies surrounding American use of herbicides had become "a contributing element in the growing opposition to American involvement in Vietnam." Appx2583. The government's own studies showed that ingredients in the herbicides could harm research animals, and the American Association for the Advancement of Science concluded that they posed "a probable health threat to humans." Appx2583. The U.S. government terminated its large-scale aerial spraying operations in Vietnam in 1971. Appx2584.

American use of herbicides in Vietnam wasn't limited to large-scale defoliation spraying campaigns, however. According to the National Academies of Science (NAS), "[a]n unknown, but smaller quantity of herbicides was applied around base perimeters and lines of communication to improve visibility and reduce the likelihood of enemy ambush." Appx2576. Hand-sprayed herbicides were also used for

"defoliation around Special Forces camps [and] clearance of perimeters surrounding airfields, depots, and other bases." Appx2585.

Although the military kept records of its large-scale aerial spraying, corps were authorized to spray around their bases without seeking permission, Appx2585; therefore, "[r]ecords of these smaller-scale uses of herbicides were not systematically logged," Appx2576; *accord* Appx2585. Department of Defense (DOD) policies purportedly forbade small-scale uses of toxic herbicides like Agent Orange at U.S. military locations. *See* Appx2178. But according to the U.S. Army's contemporaneous reporting, "Such uses seemed so obvious and so uncontroversial at the time that little thought was given to any detailed or permanent record of the uses or results." Appx2586.

The NAS estimates that 10-12% of the herbicides used in Vietnam—so, roughly 2 million gallons—was dispensed on the ground, including on and around American bases. Appx2586; *see also* Appx2598 ("Considerable quantities of herbicides were also sprayed from boats and ground vehicles, as well as by soldiers wearing back-mounted equipment."). With respect to Agent Orange specifically, roughly 220,000 gallons were "sprayed from the ground around base perimeters

and cache sites, waterways, and communication lines." Appx2581; *see also* Appx2586.

The military used a wide and varied range of herbicides in Vietnam, many of which were identified by the color painted in a band around their 55-gallon drums. Appx2580 (Agents Purple, Blue, Pink, Green, Orange, and White); Appx2582 (Dinoxol, Trinoxol, diquat, and others). Agent Orange was an undiluted, one-to-one mixture of two acids: 2,4-dichlorophenoxyacetic acid ("2,4-D") and the *n*-butyl ester of 2,4,5-trichlorophenoxyacetic acid ("2,4,5-T"). *See* Appx2579; Appx2581. The latter of these acids, 2,4,5-T, was contaminated by "a very toxic material" called 2,3,7,8-tetrachlorodibenzo-*p*-dioxin ("TCDD"). Appx2582.

DOD "took few precautions to prevent troops' exposure to herbicides since they were considered to be a low health hazard." Appx2586.

The U.S. Military Used Toxic Herbicides On Guam

U.S. operations in Vietnam were directly supported by and often originated from the military bases on Guam. These included B-52 bomber flights, for example, many of which departed from Guam. *See*

Appx574; Appx2203. Veterans stationed there recall that, while servicing the bombers before missions, they experienced the smells and skin blistering that are often telltale signs of exposure to toxic herbicides. *See* Appx2203.

Much as it did in Vietnam, the military used herbicides to clear vegetation and maintain infrastructure at its installations on Guam, including Anderson Air Force Base. According to the U.S. Navy, military stationed in Guam used herbicides containing 2,4,5-T "for weed control along power lines and power substations" until 1980. Appx2094-2095; *see also* Appx2201. They were also useful for "controlling vegetation adjacent to flightlines or along perimeter fencing." Appx2179.

Eyewitness accounts from individual veterans confirm these uses on Guam. Veterans recall "prepar[ing], mix[ing], and spray[ing]" Agent Orange, identified by its "colored bands," along pipelines, flightlines, building perimeters, and security fences on the island. Appx18; *see also* Appx17; Appx2203. The spraying took place so close to other troops that it would form a "chalky white" substance on them, Appx18, and make them nauseous, Appx14. As part of firefighting training

conducted at Anderson, trainees would practice in "pit fires" concocted from leftover drums of fuel and herbicides, crawling through the resulting toxic fumes. Appx19; *accord* Appx531.

As noted above, DOD purported to restrict the use of so-called tactical herbicides like Agent Orange, forbidding their use at U.S. military installations. *See* Appx2178. But just as that policy failed to stop small-scale spraying in Vietnam, it also failed to stop the spraying of toxic herbicides on Guam. Appx17-19.

As a result of Congress's "concern" that "exposures to Agent Orange may have occurred on Guam," the U.S. Government Accountability Office (GAO) was tasked with studying the evidence of its presence there. Appx2170. Its 2018 report confirmed the use of toxic herbicides in Guam, including the TCDD contaminant found in Agent Orange. *See* Appx2179 & n.30. With respect to the use of Agent Orange in particular on Guam, the report's conclusions were limited by the sparse records still available. At least one and as many as four ships transporting Agent Orange docked at Guam, but records do not show what was loaded or unloaded. Appx2165; Appx2197. Military records account for the use or disposal of most of the Agent Orange

procured by DOD, but nearly 2 million gallons—one in ten barrels—are still unaccounted for as a result of shortcomings in the records. Appx2165. The GAO purported to rule out the possibility of small-scale Agent Orange spraying on Guam in light of the supposed DOD policy forbidding it, Appx2203—the same policy that was widely ignored because such uses were "so obvious and so uncontroversial at the time," *supra* p. 6 (quoting Appx2586). In part for want of sufficient record-keeping, the GAO report did not address—and therefore did not rule out—the presence or use of other so-called tactical herbicides (like Agent Pink and Agent Purple) on Guam. *See* Appx2169 n.1; Appx2194 n.57.

Recent testing conducted for the U.S. Environmental Protection Agency (EPA) has also confirmed the use of toxic herbicides on Guam. Trace amounts of 2,4-D and 2,4,5-T, the two components of Agent Orange, were detected in multiple samples taken in 2018 on Guam, including from Anderson Air Force Base. Appx2139-2140. These results "indicate the presence of … residual chlorinated herbicides" in Guam's soil, Appx2141, despite significant obstacles to fair and accurate testing. First, the U.S. government has refused to test for the toxic

contaminant in Agent Orange, TCDD. Appx2216. Second, 2,4-D and 2,4,5-T have half-lives of 14 and 24 days, respectively. Appx2217. As a result of environmental degradation, many sites of herbicide spraying in the 1960s and 70s are "likely" to retain low or "no detectable concentrations" today. Appx2217; *see also* Appx2140. Third, the government failed to follow its own testing procedures, taking too little soil for some samples, Appx2139-2140, and simply failing to report results on other samples, Appx2137. Against these odds, the Guam samples still tested positive.

The U.S. Military Stored And Leaked Toxic Herbicides On Johnston Island

Johnston Island is part of an isolated coral atoll, 800 miles southwest of Honolulu. Appx2097. Despite its remote location, its coral-reef makeup, and the lack of a freshwater drinking source, Johnston Island (or "Johnston") has proven historically and strategically important for the United States, first as a lucrative guano deposit in the late 1800s and then as a military installation and nuclear test site in the 1900s. Appx2100. It also has a long history of storing toxic American waste, including radioactive contamination from atomic

tests and chemical weapons like nerve and mustard gas. Appx2101; Appx2104.

Johnston Island again proved useful following the Vietnam War, when the American government was faced with disposing of the remaining stock of Agent Orange. Appx2104. In 1972, the Air Force transferred over 1 million gallons of Agent Orange in 55-gallon steel drums to a storage location on Johnston. Appx2104. The drums remained there for five years until they were incinerated in 1977. Appx2104. "However, an unknown number of barrels leaked while stored on land[,] and some barrels were dumped into the lagoon." Appx2104; *accord* Appx2113. Due to corrosion, the drums had to be continuously replaced, and an estimated 49,000 pounds of Agent Orange "escaped into the environment" each year. Appx2113; Appx3494; *see also* Appx3850 (Air Force observation that "redrumming is a major problem" on Johnston). The photograph below shows the drums in 1975, some visibly corroding and most missing the hallmark orange band.

Appx2186. It took the military roughly 15 years, until 1989, to finish remediating and cleaning the "remaining 2,3,7,8-TCDD-contaminated soil" at the Johnston storage site. Appx2186.

Testing data from Johnston verifies that toxic herbicides were stored there in conditions that caused significant leakage. Testing conducted while the drums were still on the island indicated "significant concentrations" of Agent Orange in the area. Appx3459. Water samples taken by the Air Force from 1973 to 1977 tested positive for 2,4,5-T, Appx3460, and during disposal of the remaining Agent Orange, samples taken at the intake site for Johnston's water-desalination system repeatedly detected 2,4-D and 2,4,5-T, Appx3468. The Air Force predicted at the time that "[m]easurable concentrations

of herbicide" in the soil and water would "continue to produce occasional instances of [Agent Orange] contamination." Appx3460. In a 2002 study, long after American remediation efforts were supposedly complete, and despite environmental degradation, dioxins were present in 80% of the sediment samples taken from Johnston, Appx2112-2113, and the "most toxic dioxin isomer," TCDD, was found in 28% of samples, Appx2113.

The Agent Orange Act Provides Presumptions Arising From The Military's Use Of Toxic Herbicides

The U.S. military's use of toxic herbicides in Vietnam led to "decades of concern surrounding the possible long-term health consequences of exposures to herbicides and the contaminant dioxin." Appx2476. Vietnam became a case study in the difficulty individual veterans face in proving their exposure to toxic chemicals during service. Although many American servicemembers were undoubtedly exposed to Agent Orange and other toxic herbicides "at levels associated with health effects," testing limitations render futile any attempts to assess individual exposure levels. Appx2495. As explained above, record-keeping was limited, especially with respect to the small-scale

spraying around bases that likely exposed many servicemembers. *See* Appx2576; Appx2585.

In light of these difficulties of proof, Congress and VA have afforded the presumption of herbicide exposure to veterans who served in the Vietnam War. As relevant here, Congress's investigation of toxic herbicides ultimately led to enactment of the Agent Orange Act of 1991, Pub. L. No. 102-4, 105 Stat. 11. The Act provides the presumptions of exposure and service connection for Vietnam veterans suffering from specified conditions including non-Hodgkin's lymphoma, soft-tissue sarcoma, and chloracne. 38 U.S.C. § 1116(a)(1)-(2), (f). The Act provides a specific definition of "herbicide agent," namely, "a chemical in an herbicide used in support of the United States and allied military operations in the Republic of Vietnam during the period beginning on January 9, 1962, and ending on May 7, 1975." *Id.* § 1116(a)(3). And it instructs that "[f]or purposes of establishing service connection for a disability or death resulting from exposure to a[n] herbicide agent," Vietnam veterans "shall be presumed to have been exposed during such service to an herbicide agent containing dioxin or 2,4-dichlorophenoxyacetic acid, and may be presumed to have been

exposed … to any other chemical compound in an herbicide agent, unless there is affirmative evidence to establish" otherwise. *Id.* § 1116(f).

In the ensuing years, the Act has been amended to enumerate additional diseases, including Hodgkin's disease, respiratory cancers, and diabetes mellitus. *Id.* § 1116(a)(2). VA has promulgated regulations implementing the Act's presumptions, as well as extending them to other, analogous circumstances. VA's regulations mirror the statutory definition of "herbicide agent" and further specify that the "chemical[s]" in question are "2,4-D; 2,4,5-T and its contaminant TCDD; cacodylic acid; and picloram." 38 C.F.R. § 3.307(a)(6)(i). The regulations confirm the judicial interpretation of the Act such that service in Vietnam is defined to include "service in the waters offshore" Vietnam, too. *Id.* § 3.307(a)(6)(iii); *accord Procopio v. Wilkie*, 913 F.3d 1371 (Fed. Cir. 2019) (en banc). And the presumption of exposure is extended by regulation to veterans who served during specified times in or near the Korean demilitarized zone, *id.* § 3.307(a)(6)(iv), and those who regularly interacted with the C-123 aircraft that sprayed Agent Orange, *id.* § 3.307(a)(6)(v). Finally, VA's adjudication manual

instructs that herbicide exposure is to be conceded for veterans who served in certain circumstances on Thai military bases, where toxic herbicides were also sprayed. M21-1 Manual § IV(ii)(1)(H)(4). With respect to other locations, including Guam and Johnston Island, the manual requires individual factual proof of exposure. *See id.* § IV(ii)(1)(H)(5)-(6).

MVA Petitions VA For Rulemaking

On December 3, 2018, MVA petitioned the Secretary to commence rulemaking to consider whether to recognize a presumption of exposure to toxic herbicides for veterans who served on Guam and Johnston Island during and just after the Vietnam War era. Appx10-11.[1] MVA explained that 2,4,5-T had been detected on Guam, indicating the use of toxic herbicides there. Appx10. With respect to Johnston Island, MVA explained that veterans were exposed to Agent Orange via the well-documented leakage and contamination from the drum storage site.

[1] MVA also sought recognition of the presumption for veterans who served in American Samoa. Appx2087; Appx2148. MVA's understanding is that American servicemembers who served in American Samoa were processed through Guam. Accordingly, a presumption that applies to Guam will also extend to those who served in American Samoa.

Appx11. MVA provided a draft regulation enshrining the proposed presumption of exposure. Appx12. In April 2019, the Secretary informed MVA that it was still reviewing the relevant records. Appx2086.

In the fall of 2019, MVA member and representative Brian Moyer traveled to Guam to meet with local and federal officials. A6[2]; Appx2133. From 1974 to 1976, Mr. Moyer served as a Marine on Guam, where he personally witnessed herbicide spraying. A6. When traveling and climbing along the pipeline that served the military bases, Mr. Moyer and his fellow Marines would find themselves "covered with an oily substance that smelled like diesel fuel." A6; *see also* Appx2201 (documenting herbicide spraying along the pipeline); Appx2179 (documenting mixtures of herbicide and diesel for small-scale spraying).

When he returned to Guam in 2019, Mr. Moyer identified "several areas where [he] had witnessed spraying or where other veterans told [him] that they had witnessed spraying." A6. The EPA then tasked its

[2] Affidavits from MVA's chairman and two of its members are included in the addendum to this brief, at A1 through A7.

Superfund team with testing the soil at those locations. A13; Appx2133.

With no further update from VA, on December 2 and 23, 2019—one year after its initial petition—MVA wrote to the Secretary with updates and additional factual support for its petition, including updated testing results from Guam. Appx2087-2088; Appx2134-2141.

On May 12, 2020, the Secretary denied MVA's petition for rulemaking. Appx2143-2148. On July 10, 2020, MVA timely filed this petition for review of the Secretary's denial. ECF No. 1-2. Because the Secretary's initial decision had not considered the individual veterans' affidavits submitted with MVA's original petition for rulemaking, the Secretary then sought a voluntary remand to issue a new decision on the proper record. ECF No. 11.

The Court granted the remand motion, ECF No. 16, and the Secretary again denied MVA's petition on February 10, 2021, Appx1-9. VA's denial asserts that presumptions offered under the Agent Orange Act and related regulations apply only to what VA termed "tactical herbicides." Appx3. VA contrasted so-called tactical herbicides with "commercial herbicides," which it asserted were outside the scope of the

Act. Appx3. It then concluded that there was "no evidence" of Agent Orange or other "tactical herbicides" on Guam, and, therefore, there could be no presumption. Appx6.

With respect to Johnston Island, VA acknowledged leakage from the Agent Orange storage site. Appx7-8. But it reasoned that no presumption of exposure was warranted because civilian contractors maintained the storage drums, the storage site was "fenced and off limits from a distance," Appx7, and exposure from leakage was "well below permissible levels," Appx8.

VA notified this Court of its remand decision on February 19, 2021, ECF No. 17, and the Court thereafter reinstated MVA's petition and ordered briefing, ECF No. 19.

SUMMARY OF ARGUMENT

I. MVA has standing to bring this petition for judicial review of the Secretary's denial. As an association of veterans and their advocates, MVA has associational standing. Its veteran members are adversely affected and would have standing to sue in their own right, the challenge is germane to MVA's purpose of assisting veterans in obtaining benefits, and the challenge presents questions of law that do

not require individual veteran participation. MVA also has direct standing arising from its activities investigating the topic of toxic-herbicide exposure on Guam and Johnston Island.

II.A. The Secretary's denial of MVA's petition was contrary to law because it was based on an impermissible interpretation of the Agent Orange Act. That interpretation, which limits the Act's scope to so-called tactical herbicides, conflicts with the plain text of the Act, its purpose, and its history. It renders a key statutory term surplusage, it ignores the legislative and historical records, and it conflicts with VA's own regulations. Because VA's interpretation did not carry the force of law, and because it is unreasonable in any case, it is entitled to no deference and should be rejected.

II.B. The Secretary's denial of MVA's petition was arbitrary and capricious because it turned on the finding that there was no evidence of so-called tactical herbicides on Guam and Johnston Island—a finding that lacked a rational factual basis in this record. VA's finding relied on the absence of records of small-scale spraying—a well-documented activity on which DOD concededly did not keep records. It discounted veterans' eyewitness accounts for irrational reasons or even no reason

at all. The Secretary's denial was so untethered to the record before him that it cannot be sustained.

ARGUMENT

I. MVA Has Standing To Petition For Judicial Review Of The Secretary's Denial

MVA is a nonprofit, membership organization dedicated to serving veterans and the attorneys who serve them. MVA has made focused efforts to advance the cause of Vietnam veterans exposed to herbicides, including especially those exposed on Guam and Johnston Island. These veterans are precisely the population regulated and harmed by the Secretary's denial of MVA's petition for rulemaking. Given its composition, purposes, and activities, MVA has associational and direct standing to pursue judicial review of that denial.

To establish associational standing, an organization must show that it (1) has members who "would otherwise have standing to sue in their own right"; (2) "the interests it seeks to protect are germane to [its] purpose"; and (3) "neither the claim asserted nor the relief requested requires the participation of individual members in the lawsuit." *Hunt v. Wash. State Apple Advert. Comm'n*, 432 U.S. 333, 343 (1977); *accord Nat'l Org. of Veterans' Advocates, Inc. v. Sec'y of Veterans*

Affairs ("*NOVA*"), 981 F.3d 1360, 1368 (Fed. Cir. 2020) (en banc). Only the first two requirements come from Article III; the third is prudential. *United Food & Com. Workers Union Local 751 v. Brown Grp., Inc.*, 517 U.S. 544, 555-56 (1996).

MVA's Guam and Johnston Island veteran members would otherwise have standing to sue in their own right. The Secretary's denial deprives those veterans of the presumption of exposure arising from their service and adversely affects their ability to pursue claims for service connection. Arthur Ross, an MVA member, has a pending claim for service connection arising from herbicide exposure in Guam. A7. Another MVA member, Brian Moyer, was denied service connection for failure to establish individual exposure to herbicides during his service in Guam; his claim is pending before the Board. A6. MVA's chairman, retired Navy Commander John Wells, has attested that MVA likewise has veteran members who served on Johnston with claims that would fall within the proposed rule's scope. A3-4. Because these veteran members have claims that would be directly affected by MVA's proposed rule, these individual veterans have standing to sue. *NOVA*, 981 F.3d at 1369-70.

MVA "meets the second prong of the associational standing test because the protection of a veteran's ability to assert a [service-connection] claim in light of the rules at issue is 'germane' to a purpose of" MVA. *Disabled Am. Veterans v. Gober*, 234 F.3d 682, 689 (Fed. Cir. 2000), *overruled in part on other grounds by NOVA*, 981 F.3d 1360; *accord NOVA*, 981 F.3d at 1371. MVA was established to provide, among other things, "counseling, education and assistance to veterans in obtaining veterans benefits." A111. MVA's petition seeks to extend benefits to a group of veterans—including its own members—who were exposed to toxic herbicides during service. A successful result would advance MVA's purpose of assisting veterans in obtaining benefits.

Finally, with respect to prudential standing, neither the claim asserted nor the relief requested requires the participation of individual veterans. The petition raises "pure question[s] of law," namely, of statutory interpretation and administrative law. *Int'l Union, United Automobile, Aerospace & Agricultural Implement Workers of Am. v. Brock*, 477 U.S. 274, 287 (1986). And although "the unique facts of each [MVA] member's claim will have to be considered by the proper" agency officials, MVA can litigate this case without those individual members,

and "the remedy, if granted, will inure to the benefit of those members of the association actually injured." *Id.* at 288 (quoting *Warth v. Seldin*, 422 U.S. 490, 515 (1975)); *see also Hunt*, 432 U.S. at 344; *NOVA*, 981 F.3d at 1371.

Having satisfied all three prongs of the associational standing test, MVA may bring this petition for judicial review on behalf of its members.

MVA also has direct standing to bring the petition. A "concrete and demonstrable injury to [MVA]'s activities—with the consequent drain on [MVA]'s resources"—establishes an organization has "suffered injury in fact" warranting federal jurisdiction. *Havens Realty Corp. v. Coleman*, 455 U.S. 363, 379 (1982).

Given VA's intransigence on this issue, MVA has expended its own resources to investigate and develop the facts concerning toxic herbicides. It provides guidance, assistance, and educational materials to members of its section (Agent Orange Survivors of Guam) concerning their benefits claims. A3. And it has continued to press for remedies for veterans, including negotiations with VA, as well as federal and local environmental authorities. A2-3.

As part of MVA's advocacy on this issue, Mr. Moyer traveled to Guam in 2019 as MVA's representative and at MVA's expense. A2; A6. There, he provided Superfund investigators with the locations of herbicide spraying during the 1970s. A6; *accord* A13. These efforts by Mr. Moyer and MVA yielded test results that underscore what was already well known: TCDD was detected in 8 of the 10 soil samples, and dioxin concentrations exceeded the federal government's own regional screening levels—one sample contained 270% the acceptable level. A14-15. The relative levels of dioxin variants in a sample can provide a chemical "fingerprint," and by examining the soil fingerprints from Guam, the Superfund investigators concluded that the "patterns in some soil samples are consistent with residual chlorinated herbicides." A15; *see also* A16 (observing that relatively high concentrations of one of the variants "could be a marker indicating that TCDD was initially higher but has degraded"). In the end, the Superfund investigators concluded:

> It is probable that TCDD dioxin congener concentrations detected in soils are associated with chlorinated herbicides. Records of chlorinated herbicide use by the military on Guam and veteran affidavits documenting the use of 2,4,5-T and 2,4,5-TP along with data collected from previous soil sampling events suggest the presence and use of chlorinated

> herbicides was likely. Finally, the herbicides in question were known to contain TCDD.

A16 (citation omitted); *see also* Nat'l Veterans Legal Servs. Program & Veterans Legal Servs. Clinic, *White Paper Confirming That Veterans Who Served in Guam from 1958-1980 Were Likely Exposed to Dioxin-Containing Herbicide Agents Including Agent Orange* 3, 17 (updated Feb. 11, 2021), https://perma.cc/4TF7-9W26. These additional testing efforts were necessary because VA failed to take action after earlier results indicated the presence of "residual chlorinated herbicides" on Guam. *Supra* p. 10 (quoting Appx2141).

In sum, as VA has continued to deny the presence and consequences of toxic-herbicide use on Guam and Johnston Island, MVA has had to expend resources in turn to debunk that unscientific position. MVA therefore has direct standing to bring this petition. But what MVA has expended so far pales in comparison to the burden VA places on individual veterans to prove exposure on a case-by-case basis in the absence of a presumption.

II. The Secretary Erred In Denying MVA's Petition For Rulemaking, And The Denial Should Be Set Aside

VA's denial of MVA's petition was flawed in two key respects. First, VA read a "tactical herbicide" limitation into the Agent Orange Act that appears nowhere in its text and is unsupported by the Act's purpose and legislative history. Second, VA's finding that there is no evidence of so-called tactical herbicides has no rational basis in this record. To make that finding, VA relied on a critical assumption that is flatly undermined by the record, and it baselessly discounted affidavits from veterans about their firsthand experiences with toxic herbicides.

When reviewing an agency's denial of a petition for rulemaking, this Court applies traditional principles of judicial review under the Administrative Procedure Act (APA). The APA requires courts to "hold unlawful and set aside agency action, findings, and conclusions found to be … arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2)(A). This Court has described this as "a highly deferential standard, rendered even more deferential by the treatment accorded by the courts to an agency's rulemaking authority." *Preminger v. Sec'y of Veterans Affairs*, 632 F.3d 1345, 1353 (Fed. Cir. 2011) (per curiam). Nevertheless, this Court reviews to

ensure that the agency "has adequately explained the facts and policy concerns it relied on," to "satisfy ourselves that those facts have some basis in the record," and to "see whether the agency employed reasoned decisionmaking in rejecting the petition." *Id.* at 1353-54 (first quoting *WWHT, Inc. v. FCC*, 656 F.2d 807, 817 (D.C. Cir. 1981); then quoting *Defs. of Wildlife v. Gutierrez*, 532 F.3d 913, 919 (D.C. Cir. 2008)). VA's denial does not satisfy even this deferential standard.

A. The Secretary's tactical-herbicide interpretation of the Agent Orange Act is contrary to law.

In denying MVA's rulemaking petition, the Secretary did not dispute that he has the legal authority under the Agent Orange Act to promulgate rules that, like MVA's proposal, extend the presumption of exposure to veterans beyond the borders and waters of Vietnam. Indeed, VA has done so in the past with respect to similarly situated veterans. *See* 38 C.F.R. § 3.307(a)(6)(iv)-(v) (service in certain areas in Korea and service involving C-123 aircraft); Appx3 (describing the Act as "the statute underlying section 3.307(a)(6)"). VA has also committed to apply the Act's presumption of service connection (as opposed to exposure) to veterans exposed "to the herbicides used in Vietnam, even if exposure occurred outside of Vietnam." Diseases Associated with

Exposure to Certain Herbicide Agents, 75 Fed. Reg. 53,202, 53,205 (Aug. 31, 2010).

Implicitly recognizing its authority to promulgate the proposed rule, VA instead concluded that a presumption of exposure was not warranted by drawing a distinction between what it calls tactical herbicides and commercial herbicides. In VA's view, the Agent Orange Act applies only to so-called tactical herbicides, and according to VA, only commercial herbicides were used on Guam and Johnston Island. Appx3-4.

The Secretary's discretion to deny a rulemaking petition is not unbounded: It must still comply with applicable statutes and regulations, and a denial must be set aside when it is "contrary to law." 5 U.S.C. § 706(2)(A). In the review of rulemaking denials, the "contrary to law" inquiry is governed by the normal tools and methods of statutory interpretation. *See, e.g.*, *Hyatt v. U.S. PTO*, 904 F.3d 1361, 1374-75 (Fed. Cir. 2018), *cert. denied*, 140 S. Ct. 45 (2019).

The Secretary's interpretation of the Act fails at every stage of a traditional statutory-interpretation analysis. The toxic-herbicide limitation is flatly contradicted by the Act's unambiguous text, and that

text's plain meaning is confirmed by its purpose and legislative history. No deference is warranted to the Secretary's contrary interpretation, which conflicts with his own regulation, does not carry the force of law, and is unreasonable in any event.

1. The Agent Orange Act identifies toxic herbicides based on their chemical composition and use in support of the Vietnam War, not their tactical nature.

Which herbicides are included within the scope of the Agent Orange Act? The Act answers this question directly by defining "herbicide agent" as "a chemical in an herbicide used in support of the United States and allied military operations in the Republic of Vietnam during the period beginning on January 9, 1962, and ending on May 7, 1975." 38 U.S.C. § 1116(a)(3). The Act then directs that veterans who served in Vietnam "shall be presumed to have been exposed during such service to an herbicide agent containing dioxin or 2,4-dichlorophenoxyacetic acid [2,4-D], and may be presumed to have been exposed during such service to any other chemical compound in an herbicide agent." *Id.* § 1116(f). The Agent Orange Act therefore explicitly delineates its scope in terms of the chemical composition of the herbicide and its use in support of the Vietnam War.

The parties agree that toxic substances meeting these criteria were used on Guam and Johnston Island. As VA conceded in denying MVA's petition, 2,4-D and 2,4,5-T, the chemical components of Agent Orange, were also present in a range of other herbicides "that were commonly used on foreign and stateside military bases, in Guam and elsewhere." Appx2.

The Secretary's denial instead hinges on distinguishing between what he calls "tactical herbicides" and "commercial herbicides." Appx2. The Secretary describes tactical herbicides as those used in "large-scale application … for the deliberate purpose of eliminating plant cover for the enemy." Appx3. He describes commercial herbicides as those used "for standard vegetation and weed control." Appx2. The terms "tactical" and "commercial" are absent from the text of the Act. 38 U.S.C. § 1116. For this distinction, VA instead relies on the qualifier that an herbicide must have been "used in support of the United States and allied military operations in the Republic of Vietnam." Appx3 (quoting *id.*). The text cannot bear the weight of this distinction, hefted onto it nearly 30 years after the fact.

As an initial matter, the Secretary's interpretation reads the words "support of" out of the statute. Herbicides deployed in large-scale spraying missions to eliminate enemy cover were herbicides used *in* military operations. The military's codename for these missions was "*Operation* Ranch Hand," and "[a]ll large-area defoliation missions were flown exclusively by Ranch Hand crews" as part of that operation. Appx2576 (emphasis added). Other toxic herbicides were used *in support* of those missions by, for example, clearing flightlines for spraying aircraft. Appx2179. Indeed, the military considered its activities on Guam and Johnston Island to be a key source of "support" for its Vietnam efforts.[3]

Cabining the Act's reach to herbicides used in operations would render the words "support of" surplusage despite "the well-established principle that we must 'give effect, if possible, to every clause and word of a statute and should avoid rendering any of the statutory text

[3] *See, e.g.*, Appx550; Appx574 ("The 43rd [Strategic Wing on Guam] was tasked to support Linebacker II bombing missions over Hanoi and Haiphong, North Vietnam."); Appx4196 ("During the years of the Vietnam conflict, Johnston Atoll continued to support the flow of air traffic…. Formations of tactical aircraft made use of Johnston Atoll's refueling facilities….").

meaningless or as mere surplusage.'" *Heinzelman v. Sec'y of Health & Hum. Servs.*, 681 F.3d 1374, 1379 (Fed. Cir. 2012) (quoting *Sharp v. United States*, 580 F.3d 1234, 1238 (Fed. Cir. 2009)). Because VA's "position is at odds with this principle," this Court should "decline to adopt" it. *Id.*

The Secretary's interpretation also conflicts with the ordinary, contemporary meaning of the word "support," which is the starting point for any statutory analysis. *See, e.g.*, *Food Mktg. Inst. v. Argus Leader Media*, 139 S. Ct. 2356, 2364 (2019); *O'Farrell v. Dep't of Def.*, 882 F.3d 1080, 1084 (Fed. Cir. 2018). "Support" means "to sustain … under trial or affliction," "to maintain … by supplying with things necessary to existence," and "to act with or … assist in performance." *Support*, *The Random House Dictionary of the English Language* (2d ed. 1987); *accord Support*, *Webster's Ninth New Collegiate Dictionary* (1990) ("[to] assist, help," "to act with," "to keep (something) going"). There is no requirement in the Act or in the meaning of "support" that this assistance must have been direct or immediate. In the context of the Vietnam War, even what the Secretary termed "standard vegetation and weed control" was often conducted in support of military operations

in Vietnam. Just as some toxic herbicides were used in large-scale aerial spraying operations, others were used "in support of" those operations by, for example, clearing flightlines and maintaining runways. *See, e.g.*, Appx18; Appx2179.

This meaning of "support" matches this Court's understanding of that term in similar contexts. In *O'Farrell*, for example, just as here, the agency "summarily" reached its conclusions "[w]ithout engaging in the appropriate statutory analysis" of the same word, "support." 882 F.3d at 1083. There, an attorney at a Naval Surface Warfare Center site in California deployed to Afghanistan, and Mr. O'Farrell was called to active duty from the U.S. Army Reserve to replace him. *Id.* at 1082. The agency denied Mr. O'Farrell the leave to which he was entitled because it determined that his active duty was not directly "in support of a contingency operation" as required by 5 U.S.C. § 6323(b)(2)(B). This Court unanimously reversed, concluding that nothing in the text, statutory scheme, or legislative history supported the agency's distinction between direct and indirect support. 882 F.3d at 1083-86. This Court held that, even from as far away as a desk in California, Mr. O'Farrell's service as a replacement was in support of the U.S.

military's contingency operations in Afghanistan—and that it was an abuse of discretion to conclude otherwise. *Id.* at 1087-88; *see also Gazpromneft-Aero Kyrgyzstan LLC v. United States*, 132 Fed. Cl. 202, 203 (2017) (describing fuel-supply contracts for an airport in the Kyrgyz Republic as "in support of [DOD] military operations in Afghanistan").

Just as in *O'Farrell*, the Secretary's interpretation is belied by the statute's unambiguous text and should be rejected. To the extent there is any ambiguity—and there is none—it should be resolved in favor of the veterans. *Henderson ex rel. Henderson v. Shinseki*, 562 U.S. 428, 441 (2011); *Brown v. Gardner*, 513 U.S. 115, 117-18 (1994). Indeed, the Agent Orange Act's sponsor—himself a veteran of the Vietnam War era—explained that the benefit of the doubt is at the statute's core: "Since the beginning stages of this bill's development in 1987, its purpose has been to afford veterans exposed to [A]gent [O]range and other herbicides in Vietnam the benefit of the doubt with respect to their service-connected disability claims." 137 Cong. Rec. 2483 (1991) (statement of Sen. Daschle).

2. The Secretary's interpretation conflicts with the purpose and legislative history of the Agent Orange Act.

The Secretary's tactical-herbicide limitation is likewise at odds with the Agent Orange Act's purpose and legislative history. VA's denial of MVA's petition finds no justification on these grounds, either.

As just noted, the Act's purpose was to address concerns about Agent Orange "and other herbicides." *Id.* The Act's stated goal is "to obtain independent scientific review of the available scientific evidence regarding associations between diseases and exposure to dioxin and other chemical compounds in herbicides." Pub. L. No. 102-4, 105 Stat 11, 11 (1991). In line with that purpose, the Act delineates herbicides and the related presumptions in terms of chemical composition. *See supra* p. 31 (citing 38 U.S.C. § 1116(a)(3), (f)). That makes sense: The question is exposure to toxic substances, so what reasonably matters is the risk of exposure and toxicity, not purpose. The Secretary's interpretation, by contrast, relies on an illusory distinction. As detailed above, toxic herbicides in the Vietnam War era were not easily classified as "tactical" or "commercial." Even herbicides the Secretary considers tactical, like Agent Orange, were routinely used in small-scale

spraying activity like what the Secretary describes as commercial. *See supra* pp. 6-7; Appx17-18; Appx2581; Appx2586. And even the herbicides the Secretary describes as commercial involved contamination by the same toxic compounds, including TCDD, found in the ones he describes as tactical. *See supra* p. 32; Appx2179.[4]

The legislative history also supports MVA's understanding of the statute. Despite the Act's misleading name and Agent Orange's easy availability as a shorthand for a range of toxic herbicides, members of Congress showed a sophisticated understanding of the problem they were addressing with the Act. Time and again, legislators made clear that the problem was not just Agent Orange; it was the dioxin contamination of herbicides *including* Agent Orange.[5] Then-Secretary

[4] VA asserts that "commercial" herbicides were "registered with the [EPA] prior to market availability," as if that is some guarantee of their safety. Appx2-3. That uncited assertion is contrary to the record evidence. The EPA did not even exist for much of the Vietnam War. In fact, the Department of Agriculture "had oversight of commercial herbicides," which it reviewed "primarily [for] a product's effectiveness, rather than [for] concerns about health or the environment." Appx2180.

[5] *See, e.g.*, 137 Cong. Rec. 1195 (1991) (statement of Sen. Mitchell) ("agent orange and other herbicides"); *id.* at 1201 (statement of Sen. Cranston) ("exposure to dioxin or other chemicals in herbicides"); *id.* at 2358 (statement of Rep. Conte) ("Agent orange contains dioxin, the most toxic chemical known to man."); *id.* at 2361 (statement of Rep.

of Veterans Affairs Derwinski had the same understanding when he wrote to Congress in support of the Act, *see* 137 Cong. Rec. 2345 ("exposure to herbicides—such as Agent Orange"), as did President Bush when he signed it into law, *see* President George H.W. Bush, Statement on Signing the Agent Orange Act of 1991 (Feb. 6, 1991) (same).

Notably, the Agent Orange Act was being debated just as Congress was authorizing the President to enter into the Gulf War. *E.g.*, 137 Cong. Rec. 1196 (statement of Sen. Mitchell) ("Today, thousands of American troops are massed in Saudi Arabia."); *id.* at 1820 (statement of Sen. Byrd) ("[A]t 3 o'clock in the morning today, Persian Gulf time, war came to Iraq…."). This was no trivial coincidence: the brand-new war weighed heavily on the minds of the legislators considering the Agent Orange Act, and in associating the two, they demonstrated that the Act was concerned with the health effects of toxic

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Richardson) ("exposure to agent orange, dioxin, and other debilitating chemicals"); *id.* at 2483 (statement of Sen. Daschle) ("agent orange and other herbicides"). Even criticism of the Act reflected that understanding. *See id.* at 2488 (statement of Sen. Simpson) ("dioxin is wholly overrated as being a carcinogen").

chemicals on our troops, not the purpose for which the chemicals were manufactured.[6]

The distinction VA urges between "tactical" and "commercial" herbicides appears nowhere in the legislative record. VA could not identify a single citation—not one member of Congress across reams of legislative history—endorsing VA's tactical-commercial view. The legislative records cited in the Secretary's denial letter (at Appx3) establish uncontroversial background facts about herbicides and the Vietnam War, but they say nothing about what herbicides are within the Act's scope. *See* 137 Cong. Rec. H719 (Appx2326) (Jan. 29, 1991) (recognizing widespread exposure to Agent Orange as a motivation for the Act); S. Rep. No. 101-82, at 25 (Appx2372) (1989) (noting that the majority of herbicides were sprayed by air); H.R. Rep. No. 101-672, at 5

[6] *See, e.g.*, 137 Cong. Rec. 1200 (statement of Sen. Daschle) ("This weighs heavily on the minds of some of us because we have not yet come to terms with the wounds of the last war, Vietnam—the wounds we could not see when American troops came home then."); *id.* at 2351 (statement of Rep. Edwards) (urging colleagues to assure Gulf War troops "and the American people that those who answer the call of this Nation will be taken care of by this Nation"); *id.* at 2358 (statement of Rep. Kennedy) (urging colleagues to "set an important preceden[t] not only for Vietnam veterans but for the veterans of the current war in the gulf who could potentially be exposed to God only knows what kind of chemicals").

(Appx2432) (1990) (recognizing that dioxin is present in commercial and household products). These citations do not remotely support the proposition for which they were cited, nor do they overcome the ordinary and unambiguous meaning of the Act.

On the contrary, these legislative reports confirm that VA is grasping at straws in an attempt to find any support in the history. The very same pages of the cited House and Senate Reports, for example, explain that although herbicides like Agent Orange were used "primarily for defoliation [and] crop destruction," they were also used, "on a smaller scale, clearing vegetation around U.S. fire bases and other installations, around landing zones, and along lines of communication," including from "backpacks." S. Rep. No. 101-82, at 25 (Appx2372); *accord* H.R. Rep. No. 101-672, at 5 (Appx2432).

The legislative history nowhere suggests that Congress intended to exclude this latter kind of non-"tactical" small-scale spraying, like herbicides sprayed from a backpack around a base. To the contrary, the legislative history expressly contemplates and includes such scenarios. This history does not support VA's interpretation; it dispels it.

3. The Secretary's interpretation conflicts with his own regulation.

Even VA's own regulations contradict its newfound tactical-commercial interpretation. In implementing the terms of the Act, VA did not adopt the interpretation it now advances in denying MVA's petition. Just as with the statute, the words "tactical" and "commercial" are absent from VA's regulation. *See* 38 C.F.R. § 3.307.

Also like the Act itself, VA's regulations define "herbicide agent" in terms of chemical composition and use in support of the Vietnam War. *See id.* § 3.307(a)(6)(i).[7] Indeed, the regulation doubles down on the Act's broad chemical definition, clarifying with greater precision that "herbicide agent" includes "specifically: 2,4-D; 2,4,5-T and its contaminant TCDD; cacodylic acid; and picloram." *Id.*

The Secretary rejected MVA's petition on the basis that, by MVA's logic, even the military's stateside use of herbicides containing 2,4-D for weed control would give rise to a presumption of service connection.

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[7] "For the purposes of this section, the term 'herbicide agent' means a chemical in an herbicide used in support of the United States and allied military operations in the Republic of Vietnam during the period beginning on January 9, 1962, and ending on May 7, 1975, specifically: 2,4-D; 2,4,5-T and its contaminant TCDD; cacodylic acid; and picloram." *Id.*

Appx2-4. As discussed further below, this slippery-slope argument is exaggerated; limiting principles readily apply. *See infra* pp. 48-50. But even assuming for the sake of argument that the Secretary is right, his problem is not with MVA's petition but with his own regulation, which includes 2,4-D on its face. VA could have attempted by regulation to narrow the scope of herbicides, for example, to tactical herbicides or to only those containing TCDD, the most toxic contaminant. Instead, VA chose to include 2,4-D expressly within the scope of its regulation, even though VA considers it to be a "commonly used" "commercial herbicide[]." Appx2. To the extent that this chemical was used in support of the Vietnam War, whether for weed control on a base or foliage control on the battlefield, the Act and the regulation apply by their plain terms.[8]

Where an agency's decision is inconsistent with its own regulation, that decision must be set aside. *Baude v. United States*, 955

[8] Including 2,4-D within the regulation's scope was a logical decision for VA to make even assuming 2,4-D itself was safe relative to other herbicides, because it was so often deployed in contaminated forms. Even some of the supposedly innocuous commercial herbicides used by the military during the Vietnam War were contaminated with TCDD. Appx2179.

F.3d 1290, 1304 (Fed. Cir. 2020) (quoting *Voge v. United States*, 844 F.2d 776, 779 (Fed. Cir. 1988)) (reaffirming "the rule that 'government officials must follow their own regulations'"); *see also Mass. Mut. Life Ins. v. United States*, 782 F.3d 1354, 1365-66 (Fed. Cir. 2015). VA itself set the goalposts by regulation; it should not now be permitted to move them without additional notice-and-comment rulemaking on the matter—the very remedy MVA seeks here.

4. The Secretary's interpretation is entitled to no deference.

No special deference is afforded to agency interpretations when offered in the context of a petition for rulemaking. Instead, courts defer to agency interpretations of statutes only as warranted by the traditional *Chevron* framework. *See, e.g.*, *Massachusetts v. EPA*, 549 U.S. 497, 529 n.26 (2007) (citing *Chevron, U.S.A., Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837 (1984)); *Alon Refining Krotz Springs, Inc. v. EPA*, 936 F.3d 628, 640 (D.C. Cir. 2019) (per curiam), *cert. denied*, 140 S. Ct. 2792 (2020).

As a threshold matter, because the VA's interpretation here conflicts with even its own regulation, deference is unavailable. *See, e.g.*, *Gose v. U.S. Postal Serv.*, 451 F.3d 831, 840 (Fed. Cir. 2006) ("An

agency interpretation that effectively eviscerates regulatory language is per se inconsistent with the regulation and may be accorded no deference.").

Deference is also foreclosed because VA's tactical-herbicide limitation was stated in a letter denying MVA's rulemaking petition. It was not promulgated pursuant to notice-and-comment rulemaking and does not otherwise carry the force of law. *Chevron*, therefore, does not apply. *See, e.g.*, *Christensen v. Harris Cnty.*, 529 U.S. 576, 587 (2000) ("Interpretations such as those in opinion letters—like interpretations contained in policy statements, agency manuals, and enforcement guidelines, all of which lack the force of law—do not warrant *Chevron*-style deference.").

If VA's letter were even eligible for deference, its interpretation would fail at both steps of the *Chevron* analysis. First, Congress has directly spoken to the issue, by providing an explicit definition of "herbicide agent" tied to chemical composition and use in support of the Vietnam War, not the purpose for which the herbicide was manufactured. There is, therefore, no ambiguity to be resolved by *Chevron*. *See, e.g.*, *Brown*, 513 U.S. at 118 (citation omitted)

("Ambiguity is a creature not of definitional possibilities but of statutory context, and this context negates [the agency's] reading."). Even if there were ambiguity in the straightforward language of the Agent Orange Act, the pro-veteran canon counsels resolving the ambiguity in veterans' favor. *See supra* p. 36; *Henderson*, 562 U.S. at 441; *Procopio*, 913 F.3d at 1380 (collecting cases); *see also id.* at 1382-84 (O'Malley, J., concurring) (explaining why the canon applies at *Chevron* step one).

Second, for all the reasons described above, VA's interpretation of the Act is not a reasonable one. It renders the words "support of" surplusage, and it ignores the reality of how toxic herbicides were actually used during the Vietnam War. It finds no support in the statute's purpose or history, and it is contradicted by VA regulations. VA's reasoning is not even consistent with its own prior actions. For example, VA concedes exposure for veterans who served in certain roles or locations on Thai military bases. M21-1 Manual § IV(ii)(1)(H)(4). But it does so on the basis of exposure to "commercial" herbicides, despite VA's insistence that there were no "tactical" herbicides at those bases. *See, e.g.*, *Hollenkamp v. Wilkie*, No. 18-6628, 2020 WL 698547, at *1-2 (Vet. App. Feb. 12, 2020).

The Secretary's tactical-herbicide limitation is not a reasonable one, and it has accordingly been repeatedly questioned and rejected by the Court of Appeals for Veterans Claims. *See Gray v. Wilkie*, No. 18-0123, 2019 WL 1982253, at *3 (Vet. App. May 6, 2019); *Kerwin v. McDonald*, No. 14-0875, 2015 WL 1931974, at *5 (Vet. App. Apr. 29, 2015); *Spencer v. Shinseki*, No. 12-1599, 2013 WL 2529261, at *3 (Vet. App. June 11, 2013). This Court should reject it, too.

Nor is *Auer* deference available here. VA's denial sets out an interpretation of the Agent Orange Act, Appx2-4; Appx7 & n.6; it never suggests that it is interpreting VA's own regulation. Even if it had, VA's interpretation would not be worthy of deference under *Auer*. To begin with, the regulation essentially parrots the statutory text, meaning that there is no regulation-interpreting going on at all. "Simply put, the existence of a parroting regulation does not change the fact that the question here is not the meaning of the regulation but the meaning of the statute." *Gonzales v. Oregon*, 546 U.S. 243, 257 (2006); *accord Kisor v. Wilkie*, 139 S. Ct. 2400, 2417 n.5 (2019).

Even were the Secretary's interpretation eligible for *Auer* deference, "the possibility of deference can arise only if a regulation is

genuinely ambiguous." *Kisor*, 139 S. Ct. at 2414. As the Supreme Court has explained, "when we use that term, we mean it—genuinely ambiguous, even after a court has resorted to all the standard tools of interpretation." *Id.* There is no ambiguity in the Act, and VA's regulation makes that even clearer: It unambiguously identifies toxic herbicides based on their chemical composition and use in support of the Vietnam War. 38 C.F.R. § 3.307(a)(6)(i); *supra* p. 31. In any case, the Secretary's interpretation would be unreasonable for all the reasons described above. It is made no more reasonable by reframing it as an interpretation of the regulation rather than of the statute. *Cf. Procopio*, 913 F.3d at 1386 (O'Malley, J., concurring) ("We should not reward the agency with *Auer* deference when it circumvents the rules mandated by Congress in the [APA] in its effort to reach a result contrary to the pro-veteran canon.").

5. MVA's proposed rule is not undermined by unfounded VA fears of a slippery slope.

The Secretary's denial warned of a slippery slope that would follow from granting MVA's petition. "Expanding the regulation as you urge," VA explained, "would leave no principled reason why all military personnel throughout the United States and the world whose bases

engaged in standard vegetation and weed control or contained trace amounts of dioxin would not qualify for a presumption." Appx4.

As an initial matter, MVA is not seeking an expansion of the regulation to cover new herbicides, because the statute and regulation both already explicitly cover herbicides that contain 2,4-D. Had Congress desired a more limited scope, it could have enacted a statute targeting Agent Orange by its chemical formula or even specifically targeting TCDD, the most toxic contaminant. Instead, Congress explicitly chose a broader scope, covering "dioxin or 2,4-[D]" or "any other chemical compound in an herbicide agent," and therefore affording its presumptions to a wide field of veterans. 38 U.S.C. § 1116(f). VA, too, could have attempted to promulgate a narrower definition by regulation; instead, it identified 2,4-D by name. 38 C.F.R. § 3.307(a)(6)(i). It was Congress and VA that swept in the broad class of 2,4-D-containing herbicides, not MVA.

Contrary to VA's assertion, there are several "principled reasons" why this slippery slope is neither slippery nor steep. For one thing, the statute itself expressly cabins its reach to herbicides used in support of military operations in Vietnam, limiting the scope in terms of time and

nexus to a specific conflict. *See* 38 U.S.C. § 1116(a)(3). Likewise, DOD suspended the use of 2,4,5-T in 1970, suggesting that the use of highly toxic herbicides since then has been more limited. *See* Appx2583-2584. *But see* Appx2094-2095 (noting DOD's use on Guam through 1980). The modest regulation MVA seeks here, which is defined by time, geography, and nexus to conflict, demonstrates that limiting principles are both possible and appropriate. Appx12. It would not, as VA apparently fears, require granting service connection to veterans exposed to Scotts Turf Builder, *see* Appx4 n.3, except to the extent it was used in support of the Vietnam War and harmed veterans.

6. *Massachusetts v. EPA* requires that the Secretary's denial be set aside.

When an agency declines to initiate rulemaking on the basis of a flawed statutory interpretation, the appropriate remedy is to vacate and remand. The Secretary's error here closely parallels the one identified by the Supreme Court in *Massachusetts v. EPA*. There, the EPA denied a petition for rulemaking after misinterpreting the Clean Air Act, by concluding that carbon dioxide did not fall within the scope of "air pollutants" under that statute. 549 U.S. at 528. Because the statute's text contained no such limitation, the Court refused to defer to the

EPA's interpretation. *Id.* at 529 & n.26. And because the EPA's misinterpretation formed the basis of its rulemaking denial, that denial had to be set aside. *Id.* at 532, 535.

Massachusetts also explains why VA's appeals to policy are misdirected. Even though VA's tactical-commercial distinction is absent from the Act's text and legislative materials, VA maintains that Congress could not have intended to cover commercial herbicides. VA's argument is essentially about the gestalt of the statute—that everybody knew the Act was about tactical herbicides, even if nobody said so.

That view is unsupported by the historical record as discussed above. What everybody knew in 1991 was that roughly 20 million gallons of toxic herbicides were produced for the Vietnam War, that millions of those were sprayed at small scales around bases, and that millions were also unaccounted for at the end of the War. *Supra* pp. 5-7; p. 41 (legislative records). What everybody knew was that even though DOD policy forbade the use of so-called tactical herbicides for weed-killing purposes on American bases, they did it anyways—and

they did not record their activities.[9] Appx2586 ("Such uses seemed so obvious and so uncontroversial at the time…."). Congress's solution was addressed to that problem—widespread, undocumented, and unprovable exposure—and not to any problem unique to large-scale aerial spraying, as VA now asserts. VA implies that aerial spraying on enemy territory would have led to more concerning exposures, but it has no support for that proposition. Congress could just have easily been concerned about small-scale but widespread and much more direct exposure from handheld spraying on American bases. The bottom line is that Congress did not make a choice between these two harms; it used language broad enough to remedy both.

[9] Even VA itself knew all this. In 1989, VA Secretary Derwinski commissioned a report by Admiral Elmo Zumwalt, who had served as Commander of Naval Forces in Vietnam. Appx1591. Admiral Zumwalt's report for VA explained that the military had three objectives for Agent Orange: defoliation, crop spoilage, and "clear[ing] [v]egetation around military installations, landing zones, fire base camps, and trails." Appx1592. It also explained that Agent Orange was sprayed at small scales, including by hand, but that records of that spraying were not kept. Appx1593. Admiral Zumwalt observed that "a significant, if not major source of exposure for ground forces" was from these "non-recorded, non-Ranch Hand operations." Appx1593. Later, Zumwalt's work was credited on the floor of the Senate as the Agent Orange Act was being considered. 137 Cong. Rec. 2483 (1991) (statement of Sen. Daschle).

When Congress legislates with broad remedial language, *Massachusetts* directs courts to give effect to that breadth. There, the Supreme Court explained, "While the Congresses that drafted [the Clean Air Act] might not have appreciated the possibility that burning fossil fuels could lead to global warming, they did understand that without regulatory flexibility, changing circumstances and scientific developments would soon render the Clean Air Act obsolete." 549 U.S. at 532. Here, as in *Massachusetts*, rather than targeting one particular toxic substance, Congress's language "reflects an intentional effort to confer the flexibility necessary." *Id.*

The Agent Orange Act applies to toxic herbicides used in support of the Vietnam War, regardless of whether they were manufactured for tactical or commercial purposes. The Secretary's contrary interpretation conflicts with the Act's text, purpose, and history, as well as the historical record of how herbicides were actually used in the War. Because this incorrect interpretation was the basis for VA's denial of MVA's rulemaking petition, this Court should set that denial aside and remand for a fresh determination under the proper statutory interpretation.

B. The Secretary's finding of no toxic-herbicide use was arbitrary and capricious.

In addition to reviewing the Secretary's denial for legal error, this Court asks whether the agency engaged in "reasoned decisionnmaking." *Preminger*, 632 F.3d at 1354. This includes the requirement that VA have "explained the facts and policy concerns it relied on" and that "those facts have some basis in the record." *Id.* at 1353 (quoting *WWHT*, 656 F.2d at 817). If not, then the denial was arbitrary and capricious—and must be set aside. *Id.*

VA's denial of MVA's petition lacked a rational basis in this record. It turned primarily on the absence of records of small-scale spraying, even though the government concedes such records were not kept. And it discounted veterans' eyewitness accounts for arbitrary reasons or even no reason at all. Having failed to engage in the required reasoned decisionmaking, VA's denial should be set aside.

1. The absence of official records is not a rational basis for denying the petition.

VA's denial turned on the factual finding that there was "no evidence of use, transportation, testing, or storage of Agent Orange or other tactical herbicides on Guam," Appx6, and similarly no evidence of

exposure on Johnston Island above "permissible levels," Appx9. There was, of course, extensive evidence of so-called tactical herbicides on these islands, including eyewitness veteran affidavits regarding Agent Orange in Guam and records of storage, leakage, and contamination on Johnston Island. *Supra* pp. 7-14.

VA appears to use "no evidence" in a narrower sense, stating that its "criteria required the existence of an official record, to include government reports, unit histories, shipping logs, contracts, or scientific reports or photographs." Appx2. On the basis of DOD and GAO investigations finding no such official records of tactical-herbicide exposure on these islands, VA leaps to the unfounded conclusion that there was "no evidence" at all. Appx2.

This official-record standard is belied by the record. It is undisputed as a matter of historical fact that tactical herbicides, including Agent Orange, were sprayed at small scales around American bases—despite DOD policy forbidding it. Appx2576; Appx2581; Appx2585-2586; Appx2598. It is undisputed that the military generally kept no records of this small-scale spraying. Appx2586. An estimated 2 million gallons of herbicide were sprayed at these small scales,

Appx2586, and—sure enough—roughly 2 million gallons of herbicide were unaccounted for in official records at the end of the War, Appx2165.

The absence of official records is probative only if there is some basis for believing that records would have been kept. VA knows this, because it has made and lost this argument in this Court before. In *AZ v. Shinseki*, this Court rejected VA's analogous argument about the absence of records of sexual assault in the military. 731 F.3d 1303 (Fed. Cir. 2013). In doing so, the Court agreed with the veteran that "the alleged assaults were not reported to military authorities, [so] no reasonable person could expect records documenting the assaults to exist, or infer that the absence of such records tends to prove the assaults did not occur." *Id.* at 1318. The absence of records is simply "not pertinent evidence." *Id.*

The same is true for the small-scale spraying of so-called tactical herbicides here. Army officials contemporaneously explained that they gave "little thought" to keeping records of such activities, because they "seemed so obvious and so uncontroversial at the time." Appx2586. In 1990, one of VA's own reports explained that this "non-recorded"

spraying was "a significant, if not major source of exposure for ground forces" during the Vietnam War. Appx1593. And the absence of records makes sense: Corps were not required to obtain permission for small-scale spraying, Appx2585, and at least some of the herbicide used for small-scale spraying was sourced from the "dregs" of leftover 55-gallon drums more commonly used in aerial spraying, Appx2586. The absence of records is therefore not pertinent evidence here, and by relying on it, VA made a finding that had no basis in the factual record.

The GAO report on which VA relies makes clear what it does not say. It does not address the nearly 2 million gallons of missing herbicide, for which there simply are no records. Appx2165. It does not address the so-called tactical herbicides other than Agent Orange—like Agents Pink and Purple. Appx2169 n.1. And even Agent Orange itself cannot be ruled out. At least one and perhaps as many as four ships carrying the herbicide stopped in Guam, with no records of what was off-loaded. Appx2165; Appx2197. Testing for so-called tactical herbicides specifically is impossible, since they shared many chemical components with commercial herbicides, and these components degrade over time. *See* Appx2165; Appx2179; Appx2201; Appx2215-2216. In

short, the GAO report concludes only that there were no official records of one specific tactical herbicide (Agent Orange). Because the report does not address all tactical herbicides, and because official records would not have been kept in any event, the report's conclusions are not probative of the factual issue here.

These shortcomings in the GAO report also explain why the GAO was wrong to discount eyewitness statements by veterans about the spraying of toxic herbicides—and Agent Orange in particular—on Guam. In focus groups moderated by the GAO, veterans described witnessing and coming into contact with Agent Orange in Guam, including developing boils and blisters as a result. Appx2203. The GAO rejected these veteran accounts because DOD policy forbade the use of Agent Orange for spraying on bases and because the official records show only commercial herbicides on Guam. Appx2203. That conclusion is nonsensical for the reasons just discussed: Agent Orange was sprayed at small scales around bases despite the contrary policy, and records of that spraying were not typically kept.

2. VA erred in rejecting the veterans' eyewitness affidavits.

For the same reasons, VA erred in rejecting the eyewitness veteran affidavits that accompanied MVA's petition. It concluded that the veterans who say they saw or sprayed Agent Orange could not have, because "the GAO and [DOD] have engaged in extensive reviews of available records and confirmed no evidence of tactical herbicides on Guam." Appx5. Because no official records were kept when toxic herbicides (tactical or commercial) were sprayed at small scales around bases, the lack of such records does not undermine these veterans' accounts. It is not pertinent evidence.

VA's other reasons for rejecting the veterans' affidavits fare no better. To support his finding that there was "no evidence" of tactical herbicides on Guam, the Secretary relies on Board opinions in two of the individual veterans' benefits cases. But those opinions contradict the Secretary's "no evidence" finding, because they conclude that there actually was evidence of herbicide exposure—enough, in one case, to put it "in equipoise" with VA's evidence. Appx5. That means the veteran marshalled as much evidence to support his account as VA did to support its view of the facts. Appx835. VA's irrational "no evidence"

finding should be rejected as contradicted by its own prior Board determinations and untethered from the factual record.[10]

VA may respond that although the Board found evidence of toxic herbicides generally, it did not find evidence of *tactical* herbicides. But like VA's regulations, the Board generally does not distinguish between tactical and commercial herbicides, because that distinction is illusory—and found nowhere in the law the Board is meant to apply. Instead, the Board considered the definition of herbicides laid out in VA's regulation. Appx837. The Board then refused to grant a presumption of exposure because the veteran was "not competent to testify as to the particular chemical compound of that spray." Appx837. That just underscores the need for a presumption here: Individual veterans will not have had the chemical training necessary to identify

[10] In the other cited Board opinion, VA claims that the Board "found that the evidence did not warrant 'conceding exposure [to] herbicides in service.'" Appx5 (alteration in original). The Board made no such finding. The Board instead found that the veteran "likely … was exposed to chemicals," Appx4508, but that it need not decide whether those chemicals included herbicides, because there was no nexus between the claimed thyroid condition and any possible herbicide exposure, Appx4510. The Board's supposed herbicide finding is yet another detail VA has invented out of whole cloth.

an herbicide's chemical composition, and the government—which was in a position to identify the herbicides—failed to keep records.

To reject the remaining two affidavits, VA says that it was "provided insufficient information to verify the claim status" for the veterans and that, to the extent they were exposed to toxic herbicides, they can seek benefits through their individual claims. Appx5-6. These are not answers. That the veterans may seek individual compensation says nothing about whether their sworn statements are evidence of exposure on Guam for the purpose of this petition. And, despite a three-month voluntary remand sought expressly to consider these affidavits, VA never asked MVA or the veterans for the unknown information it now vaguely claims was missing. VA seemingly could not be bothered to make the necessary factual determinations here. In the end, VA's reasons for rejecting these veterans' accounts amount to no reason at all.

Veterans offered sworn accounts of herbicide spraying, including "tactical" Agents Orange and Blue specifically, as identified by the colored bands on their drums. Appx17-18. They described spraying these herbicides in the areas where other servicemembers were

working, as well as the resulting defoliation. Appx15-16; Appx18-19. Mr. Foster recalled doing so specifically in the vicinity of Mr. Stanton, Appx18, who in turn recalls the nausea he would develop every time Mr. Foster came by spraying, Appx14. Mr. Fink was in the line of Mr. Foster's spraying, too. Appx19. VA has no response to this evidence on its merits—only its nonresponsive contentions about the lack of official records and the opportunity for individual compensation.

3. The veterans' eyewitness accounts are corroborated by the record evidence.

The aforementioned eyewitness affidavits are corroborated extensively in the record. Contrary to VA's conclusion that mere "commercial" herbicides were used for routine vegetation control (for example, around base perimeters), uncontradicted record evidence establishes that even Agent Orange itself was sprayed for these kinds of small-scale "commercial" purposes without corresponding record-keeping. *See supra* pp. 6-7.[11] The Court of Appeals for Veterans Claims

[11] In addition to this record evidence, VA is also aware of veterans' repeated accounts—made as part of their individual benefits claims—that Agent Orange was sprayed at small scales on Guam and elsewhere. *See, e.g.*, *Gray*, 2019 WL 1982253, at *1; *Kerwin*, 2015 WL 1931974, at *4-5; *Bender v. McDonald*, No. 14-3867, 2015 WL 6955353,

has criticized VA for ignoring this difficult truth about the lack of small-scale herbicide records, yet VA again ignored it here. *See, e.g.*, *Bender*, 2015 WL 6955353, at *6; *Tobin*, 2014 WL 1375560, at *6.

Testing data from both islands confirms the presence of toxic herbicides. *See supra* pp. 10-11, 13-14. Although VA trivializes the testing data as showing only trace levels of dioxins, finding even trace amounts today is remarkable in light of the lapse of time, environmental degradation, and the shortcomings of the government's testing process. *See supra* pp. 10-11; Appx2137; Appx2139-2140; Appx2216-2217. VA discounted "high concentrations of dioxins" found at the firefighting training center on Guam, for example, because they could alternatively be attributed to the combustion of waste at that site. Appx6. That conclusion is nonsensical, because it ignores the veterans' explanation that the very waste identified by VA *included barrels of*

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at *6 (Vet. App. Oct. 30, 2015); *Wheeler v. Shinseki*, No. 13-188, 2014 WL 1275449, at *4 (Vet. App. Mar. 31, 2014); *Tobin v. Shinseki*, No. 13-0611, 2014 WL 1375560, at *6 (Vet. App. Apr. 9, 2014); *Spencer*, 2013 WL 2529261, at *1; *Fleener*, 2013 WL 425346, at *2; *Boles v. Shinseki*, No. 11-3295, 2012 WL 4711643, at *1, 4 (Vet. App. Oct. 4, 2012).

leftover herbicides.[12] Appx19; Appx531. VA's reasoning—that herbicide exposure should be rejected because herbicide-containing waste was burned at that site—is irrational and has no basis in this record.

VA's assertion that the isolation of Agent Orange drums on Johnston Island somehow protected servicemembers from exposure is belied by (1) contemporaneous samples showing dioxin at the intake for the island's water-desalination system, Appx3468, and (2) samples taken across the island as late as 2002, the vast majority of which *still* showed dioxin contamination despite environmental degradation and the government's purportedly complete remediation efforts, Appx2112-2113. Johnston Island is just one square mile—smaller than Central Park. *See* Appx2100. Although VA claims that only civilians dealt with the Agent Orange drums, those civilians were living, working, showering, and eating on this same small island in the same facilities as servicemembers. VA protests that the civilians showered separately and had their clothes laundered to prevent cross-contamination.

[12] This use of industrial chemical waste was not a practice unique to Guam: During the same period, it was also burned for firefighting training at Pease Air Force Base in New Hampshire, for example. Appx359-360.

Appx8-9. But VA again misrepresents the record. The report on which VA relies for this proposition describes the safety measures taken during the brief period when the Agent Orange was being de-drummed and incinerated in July and August 1977. *See* Appx3407-3410; Appx3447. That report says nothing about safety measures taken during the years of Agent Orange storage and leakage up to that point. If anything, it suggests that such measures were temporarily introduced just for the de-drumming process. Likewise, although VA relies on the fact that the drums were stored at a distance from servicemembers and monitored for leaks, Appx7, its reliance on these safety measures is undermined by the fact that some of those drums were instead "dumped into the lagoon." Appx2104. Again, VA's conclusions lack any rational basis in the record.

In addition to direct exposures, veterans who served on these islands were likely exposed through a number of other pathways. When toxic herbicides contaminate coastal waters, they present exposure risks to servicemembers who swam in those waters or ate the seafood. Appx128; Appx177; Appx1636 (describing how TCDD builds up in fish). A 2002 survey of sediment samples collected from Johnston's lagoon

detected dioxins, including TCDD, with levels that "exceeded the screening guideline" in the vicinity of the Agent Orange storage site. Appx2113. Fishing was known to be one of Johnston's "principal forms of recreation," Appx4227, and veterans who served on Guam described eating local crabs and fish, as well as swimming and snorkeling, Appx531; Appx2059.

There was likely exposure through servicemembers' drinking water, too. As noted above, dioxin reached the intake point for potable water on Johnston. Appx3468. And Guam's Anderson Air Force Base is situated directly over Guam's sole-source aquifer. Appx383-384. By the start of the Vietnam War, the military had drilled over 100 dry-injection wells at Anderson to drain stormwater (and, as a result, toxic herbicides) into the aquifer—and then drilled wells to retrieve drinking water from that same aquifer. Appx550-551; Appx592. Years later, the Air Force recognized that "conditions on [Anderson] are conducive to contaminant migration," Appx551, and recommended closing up the injection wells, Appx561; Appx652.

In the face of convincing evidence of exposure to toxic herbicides on Guam and Johnston Island, VA resorts to invented facts and

irrelevant asides. It misrepresents the record evidence, relies on the absence of records that were not kept in the first place, and improperly rejects sworn eyewitness accounts. Because VA's factual finding that there was "no evidence" of exposure on Guam and Johnston Island has no rational basis in this record, it was arbitrary and capricious and must be set aside.

CONCLUSION

MVA respectfully requests that this Court grant its petition, set aside the Secretary's denial, and remand for rulemaking.

Respectfully submitted,

/s/ James Anglin Flynn

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April 15, 2021

Addendum

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DEPARTMENT OF VETERANS AFFAIRS
Veterans Benefits Administration
Washington, D.C. 20420

February 10, 2021

Commander John B. Wells, U.S. Navy (Retired)
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Dear Commander Wells:

Pursuant to the U.S. Court of Appeals for the Federal Circuit's December 21, 2020, order in *Military-Veterans Advocacy v. Secretary of Veterans Affairs,* Fed. Cir. No. 20-2086, this is a new response to your petition for Department of Veterans Affairs (VA) rulemaking that would extend the presumption of herbicide exposure in 38 C.F.R. § 3.307(a)(6) to Veterans who served on Guam from January 9, 1962, through December 31, 1980; Johnston Island from January 1, 1972 until September 30, 1977; and American Samoa.[1]

In reviewing disability claims premised on exposure to herbicides, VA relies on the Department of Defense (DoD) for information regarding the presence or absence of tactical herbicides in locations outside the Republic of Vietnam. VA and DoD have reviewed a Government Accountability Office (GAO) report concerning the use, testing, storage, and transportation of Agent Orange and other tactical herbicides outside of Vietnam and Korea. See "Agent Orange: *Actions Needed to Improve Accuracy and Communication of Information on Testing and Storage Locations*," GAO-19-24 (Nov. 15, 2018). DoD, working closely with VA, has also recently completed its own extensive review of documentation concerning the presence of Agent Orange and other tactical herbicides outside of Vietnam and Korea. The 18-month review involved analysis of

[1] The original petition was dated December 3, 2018, and has since been supplemented by letters dated December 2, 2019, December 23, 2019, and June 8, 2020. The June 2020 letter modified the petition by requesting that the presumption of herbicide exposure apply to Veterans who served on Guam from *August 15, 1958*, to December 31, 1980.

thousands of original source documents dating back to the inception of tactical herbicide testing shortly after the end of World War II.

Based on a review of the GAO report and DoD's own findings, VA revised the list of locations outside of Vietnam and Korea where Agent Orange and other tactical herbicides were used, stored, tested, or transported. This list was published on January 27, 2020, and can be found at https://www.publichealth.va.gov/exposures/agentorange/locations/tests-storage/outside-vietnam.asp. In order to constitute a location where tactical herbicides were used, stored, tested, or transported, the VA/DoD joint criteria required the existence of an official record, to include government reports, unit histories, shipping logs, contracts, or scientific reports or photographs. The location must have been a DoD installation, land under DoD jurisdiction, or a non-DoD location where Service members were present during testing, application, transportation or storage of tactical herbicides.

Guam

In your December 2018, December 2019, and June 2020 letters, you suggested GAO found dioxin present on Guam, and that a draft Environmental Impact Statement of the Department of the Navy confirmed the use of herbicides on the island. You also provided many documents, to include four Veterans' affidavits, photographs, excerpts from a U.S. Navy manual, a press release from the Guam Environmental Protection Agency, a letter from Weston Solutions, and a public health assessment of a firefighting training area at Andersen Air Force Base on Guam.

DoD conducted an extensive review of records concerning the use, testing, storage, and transportation of tactical herbicides; however, found no evidence of Agent Orange or other tactical herbicides on Guam. Furthermore, GAO's report found no evidence of tactical herbicides on Guam after reviewing DoD documents and other government records, and interviewing Veterans who alleged Agent Orange exposure while serving on Guam. See GAO-19-24, at 29 ("[W]e found no evidence indicating that Agent Orange or any other tactical herbicides were offloaded . . . or used in . . . Guam.").

To the extent that trace levels of 2,4-D and 2,4,5-T have been found on Guam, that would be expected. During the 1960s, these chemicals were components of commercial herbicides that were commonly used on foreign and stateside military bases, in Guam and elsewhere, for standard vegetation and weed control. Herbicides used for regular vegetation control were registered with the Environmental Protection

Agency prior to market availability and would have been used according to the manufacturer's instructions. Commercial products containing 2,4-D, such as Scotts® TurfBuilder®, continue to be sold in the United States and throughout the world. See https://scottsmiraclegro.com/products/24d-answers/ (last visited Feb. 4, 2021).

Thus, the presence of trace levels of 2,4-D and 2,4,5-T cannot be construed as evidence of the presence of Agent Orange or tactical herbicides in such locations. See GAO-19-24, at 20 ("[W]hile D[o]D documents identify the use of commercial herbicides on Guam, they do not identify the use of tactical herbicides there."). Additionally, although your December 2018 letter suggested that the difference between tactical herbicides and commercial herbicides "is of no moment," it is clear that Congress did not enact the Agent Orange Act of 1991 and codify presumptive service connection for Veterans who "served in the Republic of Vietnam" because of commercial herbicides commonly used worldwide for standard vegetation and weed control. Pub. Law No. 102-4, § 2(a)(1) (1991). Rather, Congress established presumptive service connection associated with "herbicide[s] used in support of the United States and allied military operations in the Republic of Vietnam" due to the unique nature of the application and exposure in that country. 38 U.S.C. § 1116(a)(3); 38 C.F.R. § 3.307(a)(6)(i).

More specifically, the primary purpose of the statute underlying section 3.307(a)(6) was to acknowledge the uniquely high risk of exposure, and corresponding risk to Service members' health, posed by large-scale application of herbicides for the deliberate purpose of eliminating plant cover for the enemy, as was done in the Republic of Vietnam. See, e.g., 137 Cong. Rec. H719 (Jan. 29, 1991) (Rep. Long) (recognizing the unique circumstances of Vietnam Veterans, "the first to experience widespread exposure to agent orange"); S. Rep. 101-82, at 25 (1989) (noting that the "vast majority" of the 20-plus million gallons of herbicides "used in Vietnam were disseminated by aerial spraying"). It was not intended to presume service connection for any Veteran that served in an environment containing trace amounts of dioxin coinciding with the routine use of standard commercial herbicides. See H.R. Rep. 101-672 at 5 (1990) (recognizing that "[d]ioxin is omnipresent, existing in household products, dust particles and water. It has been found in significant levels across the world. Millions of people have been exposed to it through industrial accidents, fly ash from waste incinerators, herbicide spraying, manufacturing plants, and even in some edible fish."); Institute of Medicine, *Veterans and Agent Orange* 174-75 (1994) (recognizing that 2,4-D "has been used commercially in the United States since World War II to control the growth of broadleaf plants and weeds on range lands, lawns, golf courses, forests, roadways, parks, and agricultural land").

Commander Wells

In sum, though your June 2020 letter asserted that the "spraying method" and the commercial-tactical distinction is of no "real import" where Service members "were contaminated with herbicide sprayed by their government," Congress, in the Agent Orange Act, was addressing the question of when to *presume* the service connection of certain diseases, and "the spraying method" and the extensive scale of application in Vietnam were critical factors in the decision to authorize a presumption—solely for Veterans who served in Vietnam.[2] The fact that Veterans serving in Guam supported the effort in Vietnam or may have worked with vehicles that traveled to or from Vietnam, as you stated in your June 2020 letter, does not place these Veterans in the same position as Veterans who served in Vietnam insofar as a *presumption* is concerned.

VA's regulation also recognizes two other specific situations where the risk of exposure was high for an ascertainable group of people: Veterans who served in or near the Korean demilitarized zone where herbicides were known to have been applied, and individuals whose duty regularly and repeatedly brought them into contact with the C-123 aircraft that conducted Agent Orange spray missions in Vietnam. 38 C.F.R. § 3.307(a)(6)(iv)-(v). The exposure scenario you would like included in the presumption is not comparable. The scenarios now covered in the regulation all directly relate to the deliberate application of herbicides for a tactical military purpose on a broad scale. See, e.g., 38 U.S.C. § 1821(d). Expanding the regulation as you urge would leave no principled reason why all military personnel throughout the United States and the world whose bases engaged in standard vegetation and weed control or contained trace amounts of dioxin would not qualify for a presumption.[3] Such an expansion would go far beyond Congress's intent in passing the Agent Orange Act, and VA's intent to cover comparable scenarios in the current regulation.

In support of your petition, you have provided copies of photographs seemingly showing barrels (what appear to be 55 gallon drums) of Agent Orange in Guam and areas of "browned-out" vegetation in Guam alleged to have resulted from Agent Orange

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[2] Congress has also recently extended presumptions to Veterans who served in or near the Korean Demilitarized Zone (DMZ) and offshore of the Republic of Vietnam. Pub. L. 116-23, §§ 2(a), (3)(a) (2019). These extensions are directly related to the unique nature of the herbicide application in and around Vietnam and the Korean DMZ based on the military exigencies in those areas.

[3] In your June 2020 letter, you affirmed your position that any Service member who served on duty at a base in the United States or overseas where there was use of a product containing 2,4-D (e.g., Scotts® TurfBuilder®) warrants a presumption of service connection for certain diseases.

being employed on the island. Such barrels had various uses in military operations, including shipment of lubricants, fuel additives, cleaning fluids, and non-pesticide chemicals as well as the storage of any number of materials. Furthermore, the photographs do not reveal the contents of the barrels. While the degradation of foliage and vegetation – resulting in the "brown-out" effect shown in the photographs – would be expected from the use of commercial herbicides, which were routinely used in Guam for vegetation management, it would be pure speculation to opine as to the cause of the "brown-out" effect. Additional pictures including images of an airplane, pipeline, personnel and wildlife were also submitted, which do not contain any objective evidence of tactical herbicide use. Thus, the photographs submitted do not provide sufficient evidence of the testing, use, storage, or transportation of Agent Orange or other tactical herbicides in Guam so as to warrant a presumption of exposure for all Veterans serving in Guam from 1958 to 1980.

Your submission of four Veteran affidavits also does not alter this conclusion. Veteran L.F.'s affidavit stated that he prepared, mixed, and sprayed herbicides at Andersen Air Force Base, at off-base fuel facilities, and near the cross country pipeline. According to a 2018 Board of Veterans' Appeals (Board) decision, L.F. worked with "vegetation control" and "aviation fuels," and "likely" was "exposed to chemicals" in service. But the Board found that the evidence did not warrant "conceding exposure [to] herbicides in service."

In his affidavit, Veteran R.S. stated that he performed maintenance on fuel systems and the cross country pipeline and often could not leave the area when L.F. sprayed. A 2014 Board decision found the evidence in equipoise as to whether R.S. was exposed to herbicides in service—and awarded direct service connection on that basis. *See* 38 U.S.C. § 5107(b) ("in a case before the Secretary . . . , the Secretary shall give the benefit of the doubt to the claimant"). But, importantly, the Board commented that this determination for this one Veteran, 38 C.F.R. § 20.1303, was premised on the "vacuum of evidence from the government regarding herbicide usage in Guam." Since 2014, the GAO and DoD have engaged in extensive reviews of available records and confirmed no evidence of tactical herbicides on Guam. (And, indeed, in R.S.'s case, the Board conceded exposure to "vegetation killing sprays," not tactical herbicides of "the same type as that used in Vietnam.")

We were provided insufficient information to verify the claim status of Veterans C.V. and R.F. But Veteran C.V. did not state that he observed any spraying; rather, he stated that he worked and walked in areas with brown vegetation and that L.F. later informed him that those areas had been sprayed. Veteran R.F. stated that he tried to

move away from spraying, but it would drift, and he would feel the spray. If Veterans C.V. and R.F. file for VA benefits, they—like all other Veterans—will have the opportunity to establish that any current disabilities were the result of herbicide exposure in service.

In that regard, it is important to note that the lack of a *presumption* of herbicide exposure in certain locations does not foreclose Veterans from proving such an exposure that caused a current disability. *Polovick v. Shinseki,* 23 Vet. App. 48, 52-53 (2009) (lack of a presumption does not preclude establishing direct service connection). But a presumption is an *exception* to the general burden of proof, designed for unique situations, such as where evidence of a toxic or environmental exposure, and associated health risk, are strong in the aggregate, but hard to prove on an individual basis. Presumptions are a blunt tool, contemplate false positives, and, in the area of potential exposure to toxic substances, should be employed only when the evidence demonstrates risk of exposure at meaningful levels.

Basing a presumption on, for instance, the dioxin levels in a firefighting training area at Andersen Air Force Base would implicate this issue of false positives. A high concentration of dioxins would be expected in an area that was used for firefighting activities. Dioxins are not only a byproduct of the production of the Agent Orange chemical component 2,4,5-T, but can also be released into the environment through forest fires, burning of trash or waste, or industrial activities.[4] Therefore, any high concentration of dioxins in a firefighting training area at Andersen Air Force Base would be no different from any other environment where there were fires or where firefighting equipment was utilized.[5]

In view of the extensive nature of the most recent review conducted by DoD, as well as the investigation completed by GAO, which found no evidence of use, transportation, testing, or storage of Agent Orange or other tactical herbicides on Guam, VA has decided not to promulgate a rule extending a presumption of herbicide exposure

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[4] See National Toxicology Program, U.S. Department of Health and Human Services, "2,3,7,8-Tetracholorodibenzo-p-dioxin," REPORT ON CARCINOGENS, FOURTEENTH EDITION (2016), available at https://ntp.niehs.nih.gov/ntp/roc/content/profiles/tetrachlorodibenzodioxin.pdf.

[5] See A. Schecter et al., "Characterization of Dioxin Exposure in Firefighters, Residents, and Chemical Workers in the Irkutsk Region of Russian Siberia," 47(2) CHEMOSPHERE 147-56 (Apr. 2002), available at https://www.ncbi.nlm.nih.gov/pubmed/11993630.

to Veterans who served on Guam.[6] VA will continue to consider claims of exposure on an individual, case-by-case basis.

Johnston Island

In your December 2018, December 2019, and June 2020 letters, you stated that Johnston Island was downwind of the fallout from several atmospheric nuclear tests and was a storage site for Agent Orange drums that leaked due to corrosion. DoD documents reflect that, in April 1972, nearly 25,000 barrels of Agent Orange were moved to Johnston Island (also known as Johnston Atoll) and stored in the northwest corner of the island. From July 15 to September 3, 1977, the barrels were transferred to the incinerator ship, *Vulcanus*, for incineration at sea.

Johnston Island was under the jurisdictional control of the Pacific Air Forces (PACAF) command. Personnel on the island included Air Force, Army, and Coast Guard servicemembers, and Holmes and Narver, Inc., contractors. PACAF contracted with the civilian company for maintenance of the Agent Orange storage site on Johnston Island. Civilian contractors, not military personnel, were responsible for site monitoring and re-drumming/de-drumming activities. The area was fenced and off limits from a distance. Drum leakage did occur, due to degradation of the metal drums under the environmental conditions of the island; but, on a daily basis, civilian contractors screened the entire inventory for leaks. The leaking drums were de-drummed, fresh spillage was absorbed, and the surface soil was scraped and sealed.[7]

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[6] The "pro-veteran" canon, mentioned in your June 2020 letter, does not alter my conclusion. This canon applies to the interpretation of a governing text, and "only applies in the situation where the statute or regulation at issue is ambiguous." *Kisor v. Wilkie*, 969 F.3d 1333, 1343 (Fed. Cir. 2020). To the extent you suggest this should somehow impact the interpretation of section 1116(a) as applied to this situation, the statute is not ambiguous about whether it covers Veterans serving in Guam: it does not. Of course, the Veteran-friendly nature of VA's mission is reflected in other ways beyond the canon. For example, 38 U.S.C. § 5107(b) contains the "benefit of the doubt rule", which requires VA to resolve issues in favor of the claimant "in a case before the Secretary" on which there is an approximate balance of positive and negative evidence. Regardless of whether section 5107(b) could be considered to apply to requests for liberalizing changes to VA regulations such as this one, rather than just to VA benefits decisions, VA seeks to ensure that Veterans receive all the benefits to which they are legally entitled. In any event, however, we do not view the evidence in favor of establishing a presumption in the matter at hand to be in equipoise.

[7] See T.J. Thomas et al., "Land Based Environmental Monitoring at Johnston Island - Disposal of Herbicide Orange - Final Report for Period 11 May 1977 - 30 September

Commander Wells

When an herbicide containing dioxin (such as Agent Orange) enters the environment, it is either rapidly destroyed by photodegradation or quickly binds to the soil.[8] The floor of the Johnston Island storage site was comprised of densely compacted coral. Because of the composition and properties of coral, any leaked herbicide was bound to the coral, providing little opportunity for the herbicide to become airborne. Moreover, due to the storage location and wind patterns, any airborne herbicide would rapidly be dispersed away from Johnston Island and into the open Pacific Ocean.[9] Overall, although contemporaneous independent monitors found concentrations of 2,4-D and 2,4,5-T in ambient air and water samples on Johnston Island, they concluded that any exposure was "well below permissible levels."[10]

Notwithstanding the military-civilian division of responsibilities at Johnston Island, your June 2020 letter asserted that "cross-contamination . . . would have been rampant," as "civilians and military shared common areas including latrine and shower facilities, recreational facilities, a common laundry, dining hall, chapel etc." Your support for this assertion, however, is the statement of Dr. Wayne Dwernychuk—and Dr. Dwernychuk's support for his statement is a personal communication with you. Such circular evidentiary support is not persuasive. And, to the contrary, the aforementioned independent monitors chronicled that civilian contractors (1) were

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1978," TR-78-87, at Part II, page 154 (Sep. 1978), available at https://apps.dtic.mil/dtic/tr/fulltext/u2/a076025.pdf; see also M21-1, IV.ii.1.H.5.b, available at https://www.knowva.ebenefits.va.gov/system/templates/selfservice/va_ssnew/help/customer/locale/en-US/portal/554400000001018/content/554400000014940/M21-1-Part-IV-Subpart-ii-Chapter-1-Section-H-Developing-Claims-for-Service-Connection-SC-Based-on-Herbicide-Exposure.

[8] See N. Karch et al., "Environmental fate of TCDD and Agent Orange and Bioavailability to Troops in Vietnam," 66 ORGANOHALOGEN COMPOUNDS 3689, 3690 (2004), available at http://www.dnrec.delaware.gov/dwhs/SiteCollectionDocuments/AWM%20Gallery/Hercules/Environmental%20Fate%20and%20Bioavailablity%20of%20TCDD%20and%20Agent%20Orange001.pdf.

[9] See T.J. Thomas, supra at Part I, pages 2, 4-5; Department of the Air Force, "Final Environmental Statement on Disposition of Orange Herbicide by Incineration" 108 (Nov. 1974), available at https://www.nal.usda.gov/exhibits/speccoll/files/original/0545f78d07574ee445e99187e3af4175.pdf; see also M21-1, IV.ii.1.H.5.b.

[10] See T.J. Thomas, supra at Report Documentation Page, § 20.

provided with protective coveralls that were laundered daily, and (2) had a distinct place to shower and change into clean clothing before entering into any common areas on the island.[11]

In sum, because any 2,4-D and 2,4,5-T exposure was "well below permissible levels," and because civilian contractors (not military personnel) were directly responsible for control of the storage site, VA has decided not to promulgate a rule extending a presumption of herbicide exposure to Veterans who served on Johnston Island. VA will continue to consider claims of exposure on an individual, case-by-case basis. If evidence shows that a particular Veteran was directly involved with the storage site or other activities directly associated with Agent Orange on Johnston Island, exposure to Agent Orange may be conceded.

American Samoa

Your December 2019 letters requested that VA extend the presumption of herbicide exposure to Veterans who served on American Samoa. DoD's extensive review of records concerning the use, testing, storage, and transportation of tactical herbicides found no evidence of Agent Orange or any other tactical herbicide having been present on American Samoa. Accordingly, VA has decided not to promulgate a rule extending a presumption of herbicide exposure to Veterans who served on American Samoa.

Thank you for your efforts in support of our Nation's Veterans. If you or your colleagues have any questions, please contact Mr. Cleveland Karren, Compensation Service, Veterans Benefits Administration at 202-461-1753.

Sincerely,

Thomas J. Murphy
Acting Under Secretary for Benefits

[11] See T.J. Thomas, supra at Part I, page 106.

STATE OF LOUISIANA
PARISH OF ST. TAMMANY

BEFORE ME, NOTARY PUBLIC, came and appeared, John B. Wells, a person of the age of majority who is known to me, who under oath did depose and say the following:

1. I am the Chairman of the Board of Military-Veterans Advocacy (MVA). I am a retired Navy Commander and served for 22 years as a Surface Warfare Officer on six different ships, with over ten years at sea. I possessed a mechanical engineering subspecialty, was qualified as a Navigator and for command at sea and served as the Chief Engineer on three Navy ships. I am familiar with all aspects of surface ship and other naval operations on ships during the Vietnam era. Since retirement, I have become a practicing attorney with an emphasis on military and veterans' law. I am counsel on several pending cases concerning the Blue Water Navy and filed amicus curiae briefs in other cases including *Gray v. McDonald*. Since 2010 I have visited over 500 Congressional and Senatorial offices to discuss the importance of enacting the Blue Water Navy Vietnam Veterans Act recently passed by Congress. I testified before the House of Representatives Veterans Affairs Committee in May of 2010 and the United States Senate Veterans Affairs Committee in September 2015, and the Disability and Memorial Affairs Sub-Committee of the House Veterans Affairs Committee on April 5, 2017. I have also testified in June of 2008 before the Institute of Medicine's Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides (Seventh Biennial Update) in San Antonio, Texas and on May 3, 2010, before the Institute of Medicine's Board on the Health of Special Populations in relation to the project "Blue Water Navy Vietnam Veterans and Agent Orange Exposure." I also drafted HR 1713 for the 116th Congress which called for the expansion of the presumption of herbicide exposure to those veterans who served on Guam. I initiated several rulemaking requests with amplifications to the Secretary of Veterans Affairs to extend the presumption to Guam and filed a suit under 38 U.S.C. § 502 to seek judicial review of the denial of rulemaking by the Secretary. That suit, *Military-Veterans Advocacy v. Secretary of Veterans Affairs*, docket number 20-2086, is currently pending at the Court of Appeals for the Federal Circuit.

2. I am recognized in the veteran community as the subject matter expert on

this matter. I routinely consult with Members of Congress and their staffs as well as Senators and their staffs. I further consult with the majority and minority staffs of both the House and Senate Veterans Affairs Committee. I met with the Department of Veterans Affairs Deputy Secretary Sloan Gibson in July of 2015 and again in September of 2015 on this subject. I met with then Secretary Robert McDonald on December 14, 2016 and former VA Secretary Dr. David Shulkin, M.D., on April 21, 2017 and October 24, 2017 and former Secretary Robert Wilkie on December 3, 2018 and April 11, 2019.

3. In my role with Military-Veterans Advocacy, I supervised the coordination. with the United States and Guam Environmental Protection Agencies to examine the use of herbicide on Guam. As a result, the EPA contracted with Weston Solutions Inc. to obtain and test soil samples of areas on the island of Guam. Their report dated May 22, 2019, confirmed the presence of 2,4,5-T on the island. This element was used in the manufacture of Agent Orange and the other rainbow herbicides used for vegetation control during the Vietnam War. As this study did not encompass dioxin, which is the byproduct of the chemical reaction within the herbicide, we arranged for another series of testing by the EPA. To facilitate this study, MVA dispatched and paid for our then Director for Central Pacific Islands, former Marine and Guam veteran Brian Moyer, to travel to Guam and identify areas of herbicide spraying for sampling. The results of this study were issued by Weston Solutions, Inc., in a report dated March 30, 2020 confirmed the presence of 2,3,7,8-TCDD dioxin in areas identified by Mr., Moyer. The report went on to say that: "It is probable that TCDD dioxin congener concentrations detected in soils are associated with chlorinated herbicides. Records of chlorinated herbicide use by the military on Guam (Navy, 1958) and veteran affidavits documenting the use of 2,4,5-T and 2,4,5-TP along with data collected from previous soil sampling events suggest the presence and use of chlorinated herbicides was likely. Finally, the herbicides in question were known to contain TCDD."

4. I have also reviewed the sworn affidavits of Sgt. Ralph Stanton, dated September 14, 2009, Charles Vaughan dated December 4, 2017 and Robert Fink dated January 23, 2017 confirming the spraying of herbicide, believe to be Agent Orange, on Guam. I have further reviewed the sworn testimony of M.Sgt. Leroy Foster, now deceased, who testified before a Board of Veterans Appeals hearing.

5. Military-Veterans Advocacy Inc. (MVA) is a tax-exempt IRC 50I(c](3]

Organization based in Slidell, Louisiana that works for the benefit of the armed forces and military veterans. Through litigation, legislation and education, MVA works to advance benefits for those who are serving or have served in the military. In support of this, MVA provides support for various legislation on the State and Federal levels as well as engaging in targeted litigation to assist those who have served.

6. Military-Veterans Advocacy is a membership organization. MVA has five sections, Blue Water Navy (BWN), Veteran of Okinawa (VOO), Veterans of Southeast Asia (VSEA), Veterans of the Panama Canal Zone(VOPCZ) and the Agent Orange Survivors of Guam (AOSOG). Members of the AOSOG served on Guam, American Samoa and Johnston Island. MVA provides guidance and assistance to all sections including AOSOG as well as educational material for the Section. MVA also conducted negotiations and discussions with the EPA and the Guam EPA concerning herbicide on Guam.

7. In the 1960's and the first part of the 1970's the United States sprayed over 12,000,000 gallons of a chemical laced with 2,3,7,8-Tetrachlorodibenzodioxin (TCDD) and nicknamed Agent Orange over southern Vietnam. This program, code named Operation Ranch Hand, was designed to defoliate areas around bases providing cover to enemy forces. Spraying included coastal areas and the areas around rivers and streams that emptied into the South China Sea. By 1967, studies initiated by the United States government proved that Agent Orange caused cancer and birth defects. Similar incidence of cancer development and birth defects have been documented in members of the United States and Allied armed forces who served in and near Vietnam. During the same period, 55-gallon drums of herbicide made their way to Guam and other locations both in the United States and overseas. Much, although not all, of it were shipped to Johnston Island for storage and eventual destruction.

8. Johnston Atoll consists of four small islands in the central Pacific. Johnston Island is the largest of the four islands, but it's total area is less than one square mile. The island was used as a storage site for chemical weapons, including herbicide and Agent Orange prior to its destruction at sea. In conversation with members who have served on Johnston Island, I learned that the herbicide barrels were stored on the beach. I have confirmed that by observing pictures of the storage area. In some of the pictures, you can see leakage onto the beach. I also

was informed that many barrels were re-drummed resulting in additional leakage. This leakage leached into the lagoon that was the source for the water distillation plant. Johnston Island had no natural water sources. The only water available for personnel, both military and civilian, assigned to that island was through rainwater and distillation.

9. Agent Orange was mixed with diesel fuel to help it adhere to plant life. Civilian personnel assigned to the maintenance and re-drumming area would get the herbicide on their clatters and shoes. These clothes were washed in the same laundry facility as the military and contaminated the washing/drying units. Additionally, the small island had common latrine/shower areas, a common recreation center, a common Chapel and common dining facilities. Civilian personnel would track the substance throughout the base and the close quarters could have caused cross-contamination between the military and civilian personnel.

10. Throughout the war, the United States Armed Forces on Guam supported the United States and allied operations in Vietnam. This included technical assistance, long range air strikes and repair and replenishment operations. Johnston Island was the storage and destruction point for excess herbicide used in support of the Vietnam War. MVA members participated in operations at both locations and their claims will be affected by the proposed rule and the decision of this Court.

11. Although the 1991 Agent Orange Act title refers to only one of the herbicides, the body of the Public law encompasses any herbicide containing dioxin or 2-4-D. Pub. L. 102-4. Thus, even if another herbicide was used, it still comes within the scope of the Act. Additionally, the direct exposure of any toxic substance comes under the purview of 38 U.S.C. § 1113(b). Any possible residual ambiguity was to the veteran's entitlement to the presumption must be resolved in his favor by the application of the pro-veteran canon. *Henderson ex rel. Henderson v. Shinseki* 131 S.Ct. 1197 (2011) and, *Epic Sys. Corp. v. Lewis*, 138 S. Ct. 1612, 1630, 200 L. Ed. 2d 889 (2018), coupled with Judge O'Malley's *Procopio* concurrence leave only one reasonable conclusion - that our members are entitled to the presumption of exposure to herbicides.

12. Additional information concerning the use of herbicide on Guam, American

Samoa and Johnston Island can be found at:
https://www.militaryveteransadvocacy.org/aosog.html.

John B. Wells
Commander, USN (Retired)
Chairman of the Board of Military-Veterans Advocacy

SUBSCRIBED AND SWORN TO Before Me, Notary Public, this 1st day day of April 2021.

Janice C. Wells
Notary Public #54928

My Commission Expires: At Death.

STATE OF FLORIDA
COUNTY OF LAKE

Before me, Notary Public, came and appeared Brian Moyer, a person of the age of majority who is known to me who did, under oath, say and depose the following:

I served in the United States Marine Corps July 30, 1973 - July 29, 1977. I was a Sergeant when discharged. I was stationed in Guam from February 15, 1974 - February 12, 1976. I worked security for the *USS Proteus* (AS-19).

During my time in Guam, I saw the area being sprayed multiple times at Polaris Point. The spraying was a herbicide that was used to control vegetation. The sprayed areas were kept vegetation free.

As a group, my fellow Marines and I would go for off-base walks, which we called a Aboonie stomp,@ along the pipeline that ran between Andersen Air Force Base and the Naval Station. We would go over, under, or through the pipes. When we were done, we would be covered with an oily substance that smelled like diesel fuel. I could smell a diesel fuel odor periodically while at Polaris Point.

I currently have a service-connected Agent Orange claim. My symptoms started in 2010. My claim for benefits that was denied by the VA on September 15, 2017 because the "required service in Vietnam is not shown, nor is there evidence of exposure to herbicides during military service." That appeal is currently pending before the Board of Veterans Appeals.

I was a board member of Military-Veterans Advocacy from April 4, 2018 - July 2020. I was the founder and initial member of the Agent Orange Survivors of Guam, which is a Section of Military-Veterans Advocacy. This Section became active on September 18, 2018. I am still an active member of Military-Veterans Advocacy and Agent Orange Survivors of Guam Section.

While representing Military-Veterans Advocacy, I traveled to Guam in the fall of 2019 to meet with Guamanian officials and officers of the United States Environmental Protection Agency. I identified several areas where I had witnessed spraying or where other veterans told me that they had witnessed spaying. In a report published this past summer, dioxin was found at these locations. That report can be found at: epa.guam.gov/herbicides-investigation

Affiant further sayeth naught.

Brian Moyer
Brian Moyer

SUBSCRIBED TO AND SWORN Before me, Notary Public, this 14 day of ~~November~~ Dec. 2020.

Ashley Kramer
Notary Public

My Commission Expires: _____

ASHLEY KRAMER
Commission # GG 928400
Expires December 7, 2023
Bonded Thru Budget Notary Services

STATE OF FLORIDA
COUNTY OF MARION

Before me, Notary Public, came and appeared Arthur Franklin Ross, a person of the age of majority who is known to me who did, under oath, say and depose the following:

I served in the Navy from July 1, 1966 until March 3, 1970. I was in the Reserves for two years following that time. At the time of my discharge I was a Mineman third class petty officer. My duties included the storage and preparation of sea mines for use by the operating forces in support of United States and Allied operations in Vietnam.

I was stationed in Guam from October 3, 1968 - March 2, 1970 in Naval Magazine Guam. During my time in Guam, the compound was sprayed around the fence lines about once a month for vegetation and weed control

I currently have a service-connected Agent Orange claim. I started experiencing symptoms in July of 2012. In 2012, I had my bladder, left kidney, and prostate removed. I had my right kidney removed last year. My current claim was submitted on April 3, 2019.

I am a member of Military-Veterans Advocacy. I joined Agent Orange Survivors of Guam and its Faceb0ok page on September 18, 2018. Agent Orange Survivors of Guam is a section of Military-Veterans Advocacy. Military-Veterans Advocacy has been working to extend benefits to those of us exposed to herbicide while stationed on Guam, through Congress and the courts. They have also sent people to Guam to work with the Environmental Protection Agency in identifying areas where spraying too place.

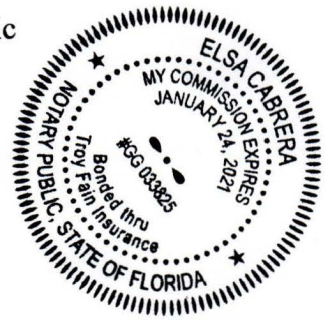
Affiant further sayeth naught.

Arthur Franklin Ross

SUBSCRIBED TO AND SWORN Before me, Notary Public, this 11th day of November 2020.

Notary Public

My commission expires: January 24, 2021



DECLARATION OF JAMES ANGLIN FLYNN

I, James Anglin Flynn, declare as follows:

1. I am an attorney admitted to practice before this Court and an associate at Orrick, Herrington & Sutcliffe LLP.

2. I am one of the attorneys representing Military-Veterans Advocacy in this case.

3. Attached as Exhibit A is a true and correct copy of a letter from Walter S. Leon Guerrero, Administrator, Guam Environmental Protection Agency, to the Honorable Therese M. Terlaje, Senator, Committee on Health Tourism, Historic Preservation, Land and Justice, dated July 6, 2020, submitting Weston Solutions, Inc. Report on Guam Chlorinated Herbicides Investigation – October 2019 Data Results Task Order Number: 68HE0919F0113 Document Control Number: 0035-08-AAJD, dated March 30, 2020.

4. Attached as Exhibit B is a true and correct copy of Military-Veteran Advocacy's articles of incorporation, located at https://www.militaryveteransadvocacy.org/uploads/3/4/1/0/3410338/final_restatement_of_articles.filed.pdf (visited April 14, 2021).

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on April 15, 2021
in Washington, D.C.

Respectfully submitted,

/s/James Anglin Flynn

James Anglin Flynn
ORRICK, HERRINGTON &
SUTCLIFFE LLP
1152 15th Street NW
Washington, DC 20005
(202) 339-8400

Counsel for Petitioner

Exhibit A

GUAM ENVIRONMENTAL PROTECTION AGENCY • *AHENSIAN PRUTEKSIÓN LINA'LA' GUÅHAN*
LOURDES A. LEON GUERRERO • GOVERNOR OF GUAM | JOSHUA F. TENORIO • LIEUTENANT GOVERNOR OF GUAM
WALTER S. LEON GUERRERO • ADMINISTRATOR | MICHELLE C. R. LASTIMOZA • DEPUTY ADMINISTRATOR

July 6, 2020

Honorable Therese M. Terlaje
Senator
I Mina'trentai Singko na Liheslaturan Guåhan
Committee on Health, Tourism, Historic Preservation, Land and Justice
Ada Plaza Center, Suite 207
173 Aspinall Avenue
Hagåtña, Guam 96910

Transmitted via electronic mail: senatorterlajeguam@gmail.com

RE: July 1, 2020 – Second follow up to Public Release of October 2019 Agent Orange Soil Sample Report

Hafa Adai Senator Terlaje,

At your request, the Agency submits the following document "Guam Chlorinated Herbicides Investigation – October 2019 Data Results Task Order Number: 68HE0919F0113 Document Control Number: 0035-08-AAJD." This report has been uploaded to our website and can be found by visiting epa.guam.gov/herbicides-investigation.

We appreciate your patience in this matter as the Agency and the rest of our stakeholders continue to augment our collective operations in the way we conduct Agency matters in the midst of the COVID-19 public health emergency. This investigation is still ongoing, and we will keep your office and the public well informed of our next steps as soon as they are finalized. These next steps will include correspondence to Department of Defense leadership to express our concerns with the findings in this report, and to advocate for continued partnership and more cooperation in our investigative efforts.

If you have any questions, please feel free to contact me at walter.leonguerrero@epa.guam.gov or 300-4751.

Walter S. Leon Guerrero
Administrator

Attachment: **Guam Chlorinated Herbicides Investigation – October 2019 Data Results Task Order Number: 68HE0919F0113 Document Control Number: 0035-08-AAJD**

cc: **Senator Sabina F. Perez, Oversight Chair, Committee on Environment, Revenue and Taxation, and Procurement**
Guam EPA Board of Directors

Weston Solutions, Inc.
2300 Clayton Road, Suite 900
Concord, Ca 94520
925-948-2600 • Fax 925-948-2601
www.westonsolutions.com

March 30, 2020

Mr. Harry Allen
Federal On-Scene Coordinator
U. S. Environmental Protection Agency
Region 9, Emergency Response Section
2445 North Palm Drive, Signal Hill, CA 90755

Subject: **Guam Chlorinated Herbicides Investigation –October 2019 Data Results**
Task Order Number: 68HE0919F0113
Document Control Number: 0035-08-AAJD

Dear Mr. Allen:

Under the Task Order (TO) No. 68HE0919F0113, the United States (U.S.) Environmental Protection Agency (EPA) Region 9 Federal On-Scene Coordinator (FOSC), Harry Allen, tasked the Weston Solutions, Inc. (WESTON®) Superfund Technical Assessment and Response Team (START), at the request of the Government of Guam, to support a continuing investigation of residual legacy chlorinated herbicides on Guam in October, 2019 (**Figure 1**).

This sampling event is a continuation of earlier investigations conducted in April 2018 and November 2018. This investigation is being conducted based on reports of chlorinated herbicide use by veterans who were stationed in Guam at the request of the Government of Guam. To date, locations within Andersen Air Force Base (AAFB) and locations along a pipeline located off base have been tested for certain herbicides (Weston, 2019). An off-base sampling event for residual herbicides was conducted by the EPA and START in November 2018. During that sampling event, trace concentrations of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) and 2-(2,4,5-trichlorophenoxy) propionic acid (2,4,5-TP, also known by the common name “silvex” or “fenoprop”) were detected in samples collected from locations along a pipeline reportedly involved in chlorinated herbicide spraying (Weston, 2019). Previous sampling locations from the April 2018, November 2018 and October 2019 sampling events are depicted in **Figure 2**.

Chlorinated herbicides were reportedly applied during the 1960s and 1970s. A Navy field manual reported 2,4,5-T was an approved herbicide for use on Guam (Navy, 1958). It is anticipated that any herbicide residuals may have undergone degradation since the time they were used. Limitations in resolution for the previously utilized EPA Method 8151A may have restricted the ability to detect the contaminants of concern at the lower concentrations necessary to quantitatively assess long-term risks. Therefore, a modified analytical method with increased resolution, EPA Method 8321A, was utilized to detect herbicides at lower concentrations than was possible with EPA Method 8151A. In addition, EPA requested dioxin/furan analysis of soil samples to provide supporting evidence of legacy chlorinated herbicide use. For the October 2019 sampling event, in conjunction with analyzing soil samples for legacy chlorinated herbicides, dioxin/furan analysis was performed using EPA Method 8290. The method includes 17 dioxin and furan congeners,

some of which were known manufacturing byproducts of the production of chlorinated herbicide components (EPA, 2006).

This letter report presents a summary of START mobilization activities and analytical results from soil samples collected during the October 2019 sampling event. **Attachment A** provides a list of citations for this document, **Attachment B** provides a photographic log of Site conditions and Site activities, **Attachment C** provides the figures for this letter report, and **Attachment D** contains the soil sampling analytical results, toxic equivalency quotient (TEQ) calculations using the Kaplan-Meier (K-M) method, and data validation reports.

Mobilization Activities

Sampling took place over two days, October 2, 2019 and October 4, 2019. The sample locations were determined based on locations provided by a veteran who reported knowledge of herbicide spraying events (**Figure 1**). For each sample, START used dedicated sampling equipment to collect 5-point composite surface (0 to 0.25 feet below ground surface) soil samples from areas where the veteran indicated herbicide spraying may have occurred. A total of ten 5-point composite surface soil samples (including two duplicate soil samples) were collected from areas along different sections of the pipeline. Samples were collected at valves and other common access points along the pipeline where spraying of chlorinated herbicides reportedly took place. Sample aliquots were collected using dedicated disposable scoops and homogenized in a disposable aluminum pan prior to being placed in a clear 8-ounce soil jar. Soil samples were placed on ice and chilled to 4 degrees Celsius prior to being shipped to a TestAmerica laboratory in Denver, Colorado for analysis. All ten soil samples were analyzed for chlorinated herbicides by EPA Method 8321A and for dioxins and furans by EPA Method 8290. A photographic log of Site conditions and Site activities is provided in **Attachment B-Photographic Log.**

Sampling Results

No detections were observed for chlorinated herbicides using EPA Method 8321A during the October 2019 sampling event (**Table 1**). One or more individual dioxin and furan congeners were detected in all 10 composite samples, including the two duplicate samples using EPA Method 8290 (**Table 2**). All sample results are compared to EPA Regional Screening Levels (RSLs) for residential soil (EPA, 2019a) and to Tropical Pacific Environmental Screening Levels (TPESL) for unrestricted land use in shallow soil where groundwater is not a concern or potential drinking water source (TPESL, 2017).[1]

For the dioxin and furan congeners, the total dioxin TEQ concentration for each sample was calculated using the K-M mean estimation technique following the EPA Advanced K-M TEQ Calculator version 9.1 (TEQ Calculator [EPA, 2014]) for comparison to the 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) RSL. These data are presented in **Attachment D - Sampling Results**. In order to calculate a TEQ, a toxic equivalent factor (TEF) is assigned to each member of the dioxin and dioxin-like compounds category. The TEF is the ratio of the toxicity of one of the compounds in this category to the toxicity of the two most toxic

[1] Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater Screening Levels, Tropical Pacific Edition (TPESL, 2017), is prepared by Hawaii Department of Health, Hazard Evaluation and Emergency Response for use in tropical areas outside of Hawaii, including Guam and the Commonwealth of the Mariana Islands.

compounds in the category, which are each assigned a TEF of 1 (i.e., 2,3,7,8-TCDD and 1,2,3,7,8-pentachlorodibenzo-p-dioxin). TEFs have been established through international agreements and currently range from 1 to 0.0001 (Van den Berg and others, 2006; EPA, 2016). A TEQ is calculated by multiplying the actual grams weight of each dioxin and dioxin-like compound by its corresponding TEF (e.g., 10 grams times 0.1 TEF = 1 gram TEQ) and then summing the results. The number that results from this calculation is referred to as grams TEQ.

Calculations of sums or totals for multi-constituent chemicals such as total dioxin TEQs have typically involved simple substitution of zero, one half the detection limit (DL), or the DL for left-centered (non-detect) congeners. Because this practice introduces bias to estimates used in statistical calculations, many sources now strongly caution against the use of arbitrary surrogate values for non-detects for data with three or more non-detect, qualified and/or rejected congeners (TEQ Calculator [EPA, 2014]). Helsel (2009) describes an approach for calculating totals using the K-M approach which uses a nonparametric maximum likelihood estimator in calculations of the intermediate mean and total TEQ on influential congeners (high toxicity, TEQ factors close to 1 [Van den Berg and others, 2006], high concentrations) (TEQ Calculator [EPA, 2014]). The EPA has been utilizing the K-M method for the treatment of non-detect dioxin congeners since 2009 (EPA, 2009a, 2009b) and developed the TEQ calculator macro in 2014 to estimate TEQ using the K-M Method. Further details regarding the use of the K-M estimator for deriving TEQ estimations are presented in the K-M discussion of the EPA Advanced K-M TEQ Calculator (TEQ Calculator [EPA, 2014]). K-M data output for this site, including the K-M TEQ calculations, using the EPA Advanced K-M TEQ calculator is provided in **Attachment D-Sampling Results.**

The total dioxin TEQ concentrations exceeded the EPA RSLs for 2,3,7,8-TCDD of 4.8 picograms per gram (pg/g), but did not exceed the TPESL (EPA, 2019a; TPESL, 2017) in 8 of 10 composite soil samples, including both duplicate samples (G-01-01-D and G-04-02-D). TEQ values exceeding the EPA RSL value ranged from 5.1 pg/g (G-03-01) to 13 pg/g (G-04-01), with the highest TEQ value at the Tiyan Junction location. The individual dioxin congener 1,2,3,4,6,7,8-heptachlorodibenzodioxin (1,2,3,4,6,7,8-HpCDD) exceeded its EPA RSL value of 480 pg/g in one sample (G-04-01). Figures depicting Site sampling locations and EPA RSL exceedances are presented in **Attachment C-Figures 3 through 6**.

Discussion

The chlorinated herbicide 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) itself is not considered carcinogenic, but 2,4,5-T was known to have varying levels of contamination with the known carcinogen, 2,3,7,8-TCDD, from the manufacturing process. Contamination with 2,3,7,8-TCDD led to the discontinuation of use of 2,4,5-T and similar chlorinated herbicides in 1985 (CDC, 2016). In previous research, TCDD was found in pre-1970 samples of 2,4,5-trichlorophenol, the manufacturing precursor of 2,4,5-T. In addition to TCDD, other polychlorinated dibenzo-*p*-dioxins (PCDDs), including 2,7-dichloro-dibenzo-*p*-dioxin and 1,3,6,8-tetrachloro-dibenzo-*p*-dioxin, were measured in the same pre-1970 samples (Cochrane and others, 1982). Additionally, herbicide formulas often included simultaneous use of chemicals including 2,4-dichlorophenoxyacetic acid (2,4-D), kerosene, and diesel (EPA, 2019b). The purity of these additive substances is unknown due to lack of data. A summary of literary citations for this document is provided in **Attachment A-Citations**.

As described above, 8 of 10 samples had total dioxin TEQ results that exceeded the RSL and 8 of 10 had detections of the 2,3,7,8-TCDD congener. All samples, including the two samples with the total dioxin TEQ below the EPA RSL value, had high levels of octachlorodibenzodioxin (OCDD) and 1,2,3,4,6,7,8-HpCDD. Without a sample of the alleged herbicides used during the reported spraying event at the Site, a site-specific dioxin congener fingerprint comparison cannot be completed. For this discussion, data collected at this Site were compared with documented dioxin congener fingerprints from peer-reviewed publications with similar contaminants of concern. Ubiquitous combustion process sources such as wood fires and vehicle exhaust are common sources of 1,2,3,4,6,7,8-HpCDD and OCDD in the environment (Quadrini and others, 2015). Also, OCDD may originate from weathering of pentachlorophenol (EPA, 2006; Quadrini and others, 2015; Towey and others, 2010). These congeners may consequently dominate regional PCDD and polychlorinated dibenzofurans (PCDF) fingerprints (Quadrini and others, 2015).

Tiyan Junction was the location where trace concentrations of 2,4,5-T and 2,4,5-TP were detected during the 2018 sampling event by EPA and START (Weston, 2019). The highest total dioxin TEQ concentration (13 pg/g in sample G-04-02) was measured at this location during this sampling event (Figure 6). Total dioxin TEQ concentrations ranged from 6.3 pg/g (sample G-04-02) to 13 pg/g (sample G-04-01), which was 1.4 times higher than any other TEQ result recorded during this sampling event and 2.7 times higher than the EPA RSL of 4.8 pg/g for 2,3,7,8-TCDD. At the Tiyan Junction location (samples G-04-01, G-04-02 and G-04-02-D [duplicate sample]), all samples contained elevated levels of 1,2,3,4,6,7,8-HpCDD, OCDD, 1,2,3,4,7,8,9-heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF) and octachlorodibenzofuran (OCDF) in relation to other congeners. Samples that contained elevated levels of 1,2,3,4,7,8,9-HpCDF and OCDF tended to have higher TEQ concentrations.

Following a similar methodology to that presented in Quadrini and others (2015) and Cleverly and others (1997), the individual congener data were plotted by sample (**Figure 7**) and the total dioxin/total furan data for each sample were plotted using mean and standard deviation to measure central tendency (**Figure 8**). Quadrini and others (2015) showed that OCDD and 1,2,3,4,6,7,8-HpCDD likely originated from non-herbicide sources (e.g., fuel combustion) and so were excluded from the data presented in **Figure 7**. Additionally, the exclusion of data for OCDD and 1,2,3,4,6,7,8-HpCDD allowed for better resolution of the congener distribution in **Figure 7**. The individual congener distribution for samples (**Figure 7**) and the central tendency for total dioxins/total furans (**Figure 8**) collected during the 2019 sampling event show high OCDF and 1,2,3,4,7,8,9-HpCDF levels, similar to herbicide fingerprints presented in literature by Cleverly (Cleverly and others, 1997). Although there is no conclusive samples from the spraying event and a complete dioxin congener fingerprint comparison cannot be completed, the congener patterns in some soil samples are consistent with residual chlorinated herbicides. **Figure 7** in **Appendix D presents** the congener distribution, excluding OCDD and 1,2,3,4,6,7,8-HpCDD as previously discussed, for all sample locations during the 2019 sampling event. **Figure 8** in **Appendix D** presents the data for total dioxins/total furans with the central tendency of sample data presented for each congener.

Summary

In the October 2019 sampling investigation, samples collected at the Tiyan Junction location contained total TEQ concentrations ranging from 6.3 to 13 pg/g (G-04-01), which was 1.4 times higher than any other TEQ result recorded during this sampling event. Total TCDD in this location ranged from 1.1 to 1.4 pg/g. In addition, the Andersen fence line location (GS-3) contained Total TCDD at concentrations ranging from 2 to 2.1 pg/g with TEQs of 5.1 and 6.0 pg/g. Although no detections of trace chlorinated herbicides were observed during the 2019 sampling event, trace concentrations of 2,4,5-T and 2,4,5-TP were detected at the Tiyan Junction location sampling site during the 2018 sampling event and have been detected on Andersen at other locations (Weston, 2019).

As previously discussed, OCDD and 1,2,3,4,6,7,8-HpCDD concentrations may be attributed to other sources. Whereas the congener 1,2,3,4,6,7,8-HpCDD is not associated with chlorinated herbicides, higher OCDD concentrations could be a marker indicating that TCDD was initially higher but has degraded. 2,3,7,8-TCDD concentrations are anticipated in soils where residual 2,4,5-T is detected.

Taking into consideration the length of time since the reported use of chlorinated herbicides on Guam and their subsequent weathering, TCDD and/or other congeners have undergone environmental degradation. Concentrations may have originally been higher because the relative degradation rates vary depending on the congener and environmental conditions (EPA, 1989). Migration of dioxin congeners within the soil profile is possible over time (Fan and others, 2006; Banout and others, 2014).

It is probable that TCDD dioxin congener concentrations detected in soils are associated with chlorinated herbicides. Records of chlorinated herbicide use by the military on Guam (Navy, 1958) and veteran affidavits documenting the use of 2,4,5-T and 2,4,5-TP along with data collected from previous soil sampling events suggest the presence and use of chlorinated herbicides was likely. Finally, the herbicides in question were known to contain TCDD.

To clarify any remaining uncertainty about herbicide types, amounts and locations sprayed, continued investigation of suspect areas is recommended. Additional sampling at depths up to 12 inches is suggested to account for possible degradation and migration of residual herbicides and dioxin congeners. Similarities and differences between sample location characteristics (environmental conditions, vegetation cover, historical land use, previous excavations, use of imported fill, etc.) and the congener profiles should be further investigated as possible markers to aid in identifying historical herbicide use.

Respectfully,

WESTON SOLUTIONS, Inc.

Amanda Wagner
START Project Scientist

Attachments:
A - Citations
B – Photographic Documentation
C – Figures
D – Sampling Results

cc: WESTON START DCN File

ATTACHMENT A: CITATIONS

Citations

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- Quadrini and others. 2015. Fingerprinting 2,3,7,8-tetrachlorodibenzodioxin contamination within the lower Passaic River. Environ Toxicol Chem. 2015 Jul; 34(7): 1485–1498. Published online 2015 May 5. doi: 10.1002/etc.2961.

- Towey and others. 2010. Hierarchical cluster analysis of polychlorinated dioxins and furans in Michigan, USA, soils: evaluation of industrial and background congener profiles. Environ Toxicol Chem. 2010 Jan;29(1):64-72. doi: 10.1002/etc.24.

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- Weston Solutions, Inc. (WESTON®). 2019. Guam Agent Orange Final Site Assessment Report. May 22, 2019.

ATTACHMENT B: PHOTOGRAPHIC DOCUMENTATION

Weston Solutions, Inc.
2300 Clayton Road, Suite 900
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925-948-2600 • Fax 925-948-2601
www.westonsolutions.com

PHOTOGRAPH LOG

Project Name:	Site Location:	Task Order No:
Guam Herbicide Investigation	Polaris Point Sampling Location, Guam	68HE0919F0113

Photo No. 1	Date: 10/02/19

Direction Photo Taken:

North

Description:

Valve pit enclosed with chain link fence and barbed wire. Remnants of a missile display stand behind the dark gray car.

5-point composite sample G-01-01 taken at this location.

Photo No. 2	Date: 10/02/19

Direction Photo Taken:

North

Description:

5-point composite sample was taken around and inside the fenced area as well as near the missile stand.

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PHOTOGRAPH LOG

Project Name:	Site Location:	Task Order No:
Guam Herbicide Investigation	Nimitz Hill Sampling Location, Guam	68HE0919F0113

Photo No. 3	Date: 10/02/19

Direction Photo Taken:

Southeast

Description:

Sample location G-02-01

Composite sample locations include the two faces of the fence line shown.

Photo No. 4	Date: 10/02/19

Direction Photo Taken:

East

Description:

Composite for sample G-02-01 also includes the area behind the metal structure shown.

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PHOTOGRAPH LOG

Project Name:	Site Location:	Task Order No:
Guam Herbicide Investigation	Nimitz Hill Sampling Location, Guam	68HE0919F0113

Photo No. 5	Date: 10/02/19

Direction Photo Taken:

North

Description:

Sample Location G-02-02

Downhill from sample G-02-01.

Some composite locations taken from the concrete abutment.

Photo No. 6	Date: 10/02/19

Direction Photo Taken:

South

Description:

Taken from same location as photo number 5 (above). Composite sample locations were collected from along the pipeline near the foil pan.

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PHOTOGRAPH LOG

Project Name:	Site Location:	Task Order No:
Guam Herbicide Investigation	Nimitz Hill Sampling Location, Guam	68HE0919F0113

Photo No. 7	Date: 10/02/19

Direction Photo Taken:

South

Description:

Composite sample G-02-03 was taken along the pipeline and concrete support structure.

Photo No. 8	Date: 10/02/19

Direction Photo Taken:

South

Description:

Composite sample G-02-03 was also taken from around the length of this pipe (same pipe as above).

Sample Location G-02-03 was uphill from both G-02-01 and G-02-02 and was the closest to the main road.

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PHOTOGRAPH LOG

Project Name:	Site Location:	Task Order No:
Guam Herbicide Investigation	Upi Elementary School Sampling Location, Guam	68HE0919F0113

Photo No. 9	Date: 10/02/19

Direction Photo Taken:

North.

Description:

Composite sample G-03-01 collected along the fence line of the Andersen Air Force Base.

Photo No. 10	Date: 10/02/19

Direction Photo Taken:

Northeast.

Description:

Sample location G-03-02 collected along fenceline outside of Andersen AFB.

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PHOTOGRAPH LOG

Project Name:	Site Location:	Task Order No:
Guam Herbicide Investigation	Tiyan Junction Sampling Location, Guam	68HE0919F0113

Photo No. 11	Date: 10/04/19

Direction Photo Taken:

West

Description:

Sample Location G-04-01.

Composite taken along the left side of the pipe. Sample Location G-04-02 can be seen in the background following the pipe.

Photo No. 12	Date: 10/04/19

Direction Photo Taken:

South

Description:

Sample Location G-04-02.

Composite taken in a radius around the valve.

ATTACHMENT C: FIGURES

0 Miles 4

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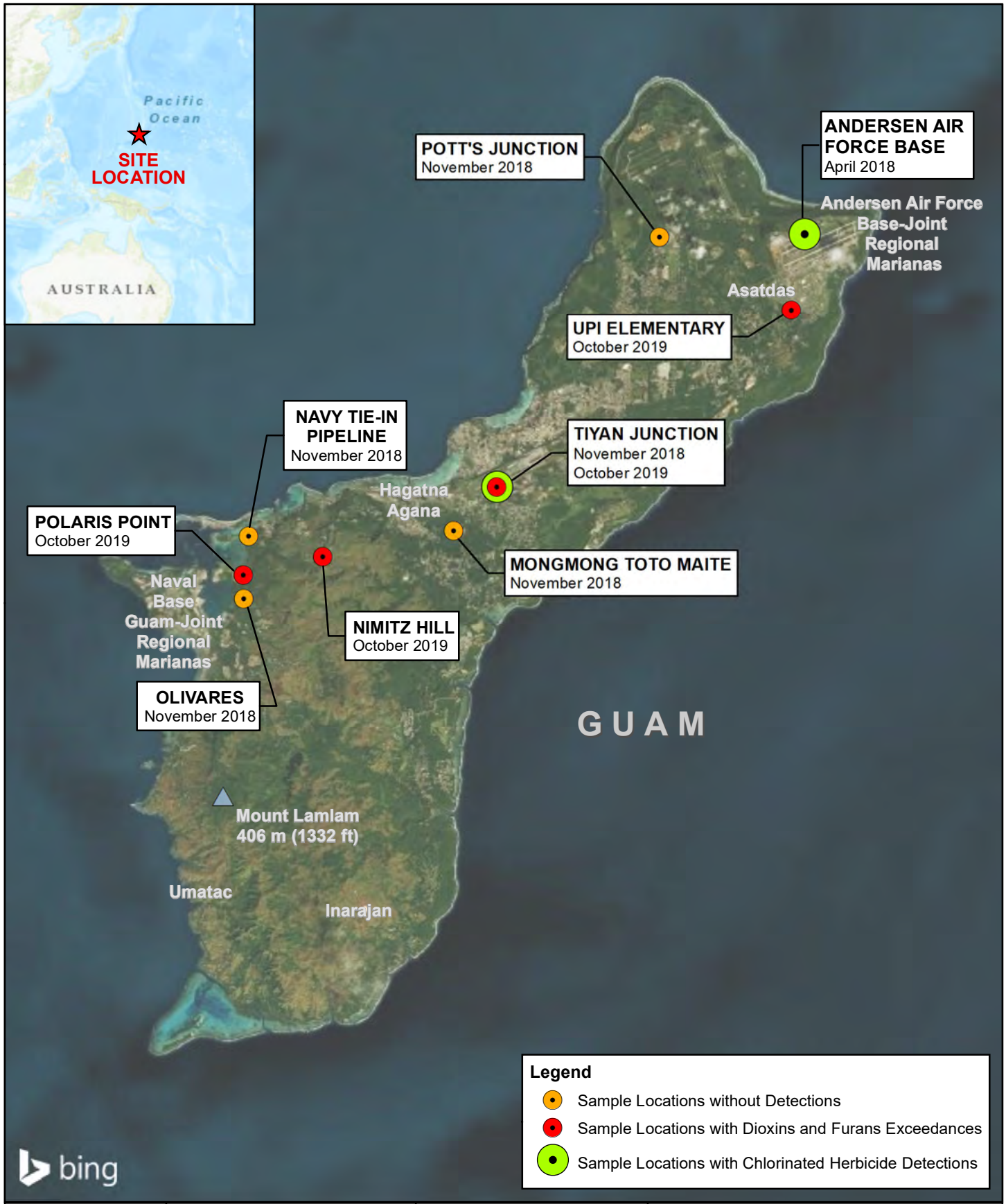
Region 9, START
Weston Solutions, Inc.
Concord, CA

PREPARED FOR:
EPA Region 9
Pacific
Southwest

FIGURE 1
SITE LOCATION
Guam Chlorinated Herbicides
Site Investigation
Guam

Contract: 68HE0919D0002; **TO:** 68HE0919F0113

Document Control Number: 0035-08-AAJD



0 Miles 4

PREPARED BY:
Region 9, START
Weston Solutions, Inc.
Concord, CA

PREPARED FOR:
EPA Region 9
Pacific Southwest

FIGURE 2
HISTORIAL SAMPLE RESULTS
Guam Chlorinated Herbicides Site Investigation
Guam

Contract: 68HE0919D0002; **TO:** 68HE0919F0113

Document Control Number: 0035-08-AAJD

Notes:
bgs = below ground surface
* All samples taken 0-0.25 ft bgs
pg/g = picogram/gram
Bold and Underlined = screening level exceedance
* TCDD TEQ = Dioxin toxic equivalency; calculated using the Kaplan-Meier approach (TEQ Calculator, 2014)

Screening Levels:
EPA RSLs = Environmental Protection Agency Regional Screening Levels for residential soil (2019) (Residential):
- TCDD TEQ: 4.8 pg/g
TPESLs = Tropical Pacific Environmental Screening Levels for unrestricted land use in shallow soil where groundwater is not a concern or potential drinking water source (2017) (Unrestricted Land Usage):
- TCDD TEQ: 480 pg/g

0 Feet 40

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Concord, CA

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EPA Region 9
Pacific
Southwest

FIGURE 3
POLARIS POINT DIOXIN AND FURANS EXCEEDANCES
Guam Chlorinated Herbicides
Site Investigation
Guam

Contract: 68HE0919D0002; **TO:** 68HE0919F0113 **Document Control Number:** 0035-08-AAJD

Notes:
bgs = below ground surface
* All samples taken 0-0.25 ft bgs
pg/g = picogram/gram
Bold and Underlined = screening level exceedance
* TCDD TEQ = Dioxin toxic equivalency; calculated using the Kaplan-Meier approach (TEQ Calculator, 2014)

Screening Levels:
EPA RSLs = Environmental Protection Agency Regional Screening Levels for residential soil (2019) (Residential):
- TCDD TEQ: 4.8 pg/g
TPESLs = Tropical Pacific Environmental Screening Levels for unrestricted land use in shallow soil where groundwater is not a concern or potential drinking water source (2017) (Unrestricted Land Usage):
- TCDD TEQ: 480 pg/g

0 Feet 60

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Concord, CA

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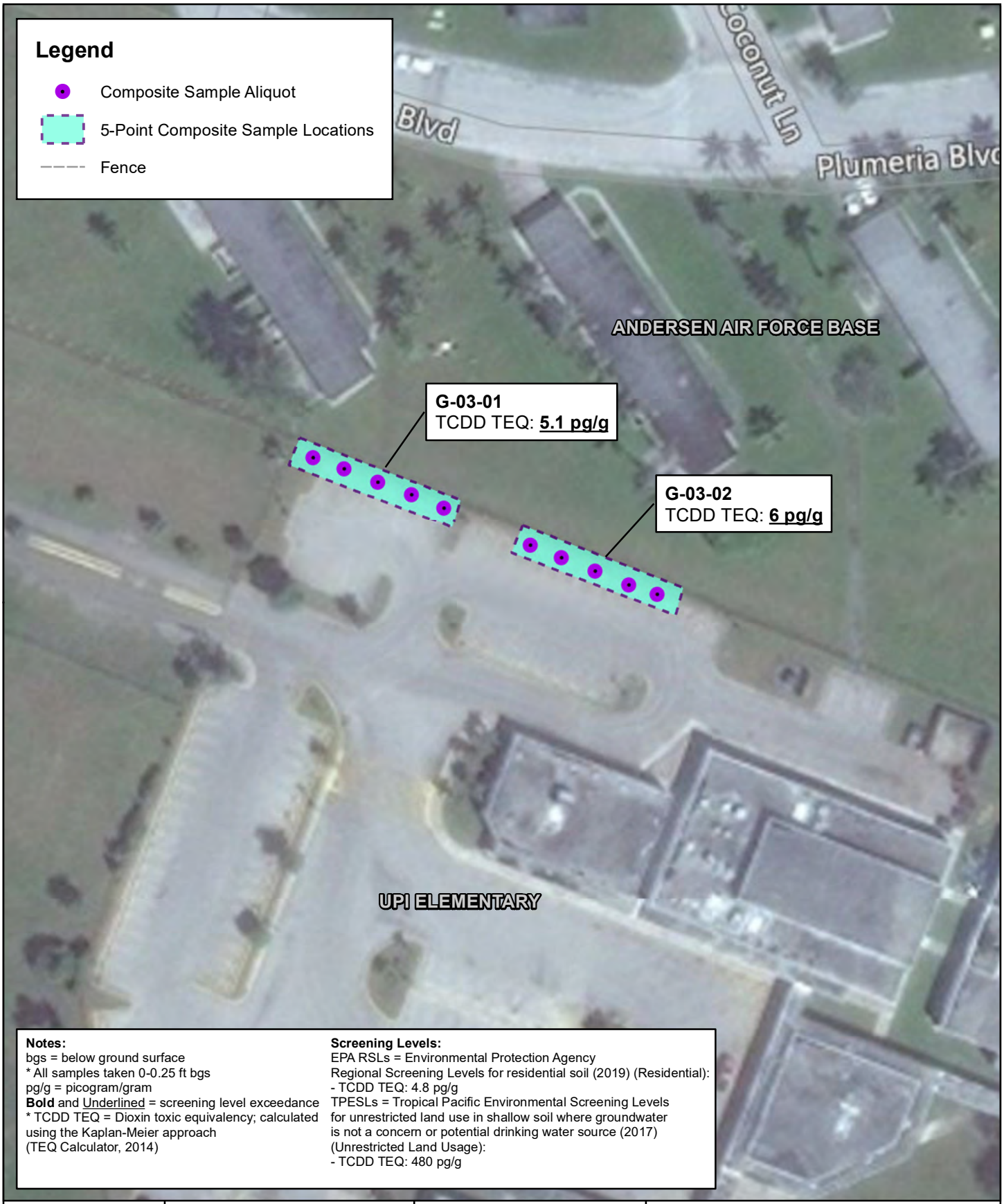
Pacific
Southwest

FIGURE 4
NIMITZ HILL DIOXIN AND FURANS EXCEEDANCES
Guam Chlorinated Herbicides
Site Investigation
Guam

Contract: 68HE0919D0002; **TO:** 68HE0919F0113

Document Control Number: 0035-08-AAJD



Notes:
bgs = below ground surface
* All samples taken 0-0.25 ft bgs
pg/g = picogram/gram
Bold and Underlined = screening level exceedance
* TCDD TEQ = Dioxin toxic equivalency; calculated using the Kaplan-Meier approach (TEQ Calculator, 2014)

Screening Levels:
EPA RSLs = Environmental Protection Agency Regional Screening Levels for residential soil (2019) (Residential):
- TCDD TEQ: 4.8 pg/g
TPESLs = Tropical Pacific Environmental Screening Levels for unrestricted land use in shallow soil where groundwater is not a concern or potential drinking water source (2017) (Unrestricted Land Usage):
- TCDD TEQ: 480 pg/g

0 Feet 60

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Concord, CA

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Pacific
Southwest

FIGURE 5
UPI ELEMENTARY DIOXINS AND FURANS EXCEEDANCES
Guam Chlorinated Herbicides Site Investigation
Guam

Contract: 68HE0919D0002; **TO:** 68HE0919F0113 **Document Control Number:** 0035-08-AAJD

Notes:
bgs = below ground surface
* All samples taken 0-0.25 ft bgs
pg/g = picogram/gram
Bold and Underlined = screening level exceedance
* TCDD TEQ = Dioxin toxic equivalency; calculated using the Kaplan-Meier approach (TEQ Calculator, 2014)

Screening Levels:
EPA RSLs = Environmental Protection Agency Regional Screening Levels for residential soil (2019) (Residential):
- TCDD TEQ: 4.8 pg/g and 1,2,3,4,6,7,8-HpCDD: 480 pg/g
TPESLs = Tropical Pacific Environmental Screening Levels for unrestricted land use in shallow soil where groundwater is not a concern or potential drinking water source (2017) (Unrestricted Land Usage):
- TCDD TEQ: 480 pg/g

0 Feet 40

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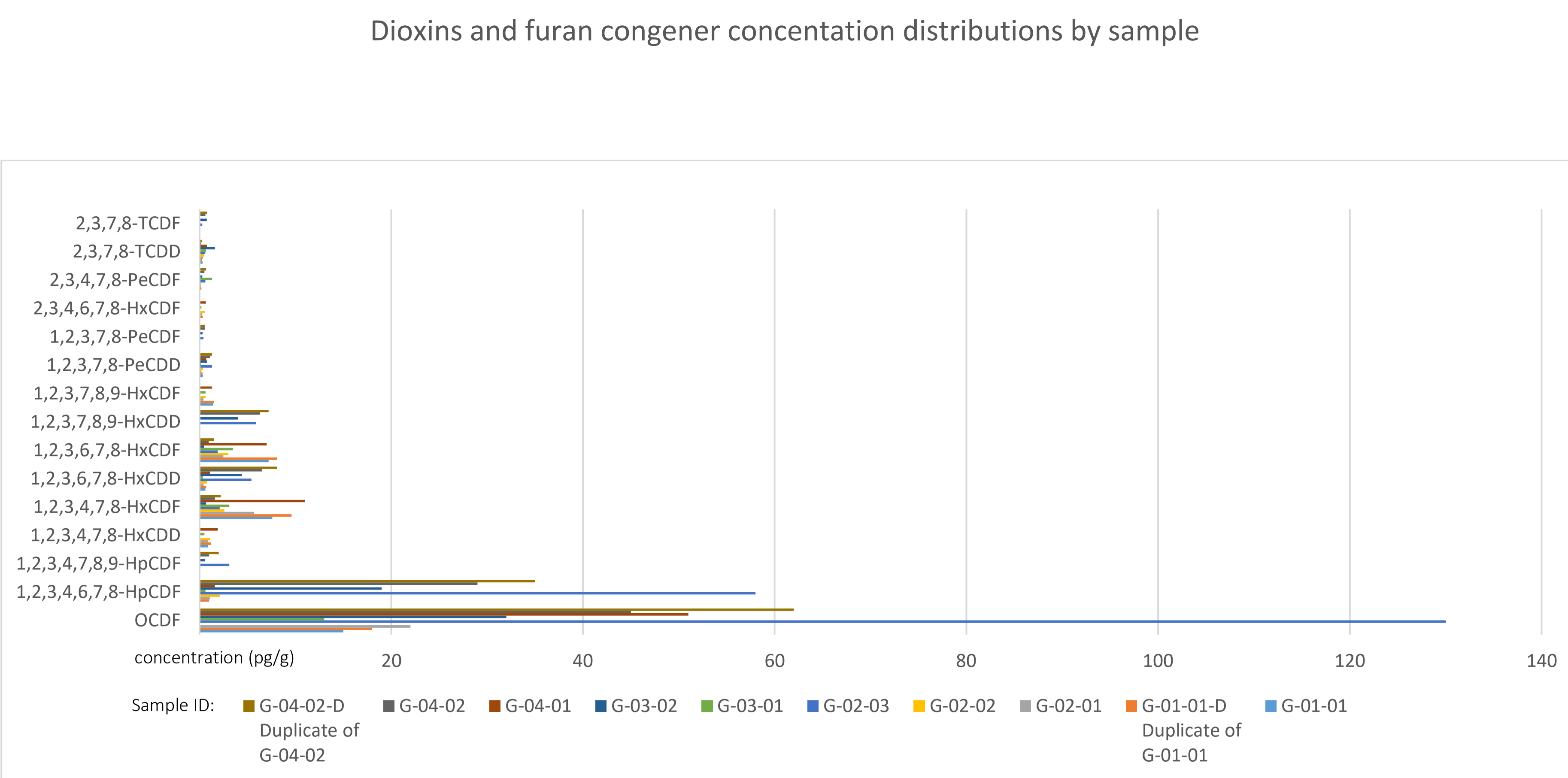
Southwest

FIGURE 6
TIYAN JUNCTION DIOXIN AND FURANS EXCEEDANCES
Guam Chlorinated Herbicides
Site Investigation
Guam

Contract: 68HE0919D0002; **TO:** 68HE0919F0113

Document Control Number: 0035-08-AAJD

Figure 7
Guam Chlorinated Herbicides Investigation
October 2019 Sampling event
Guam



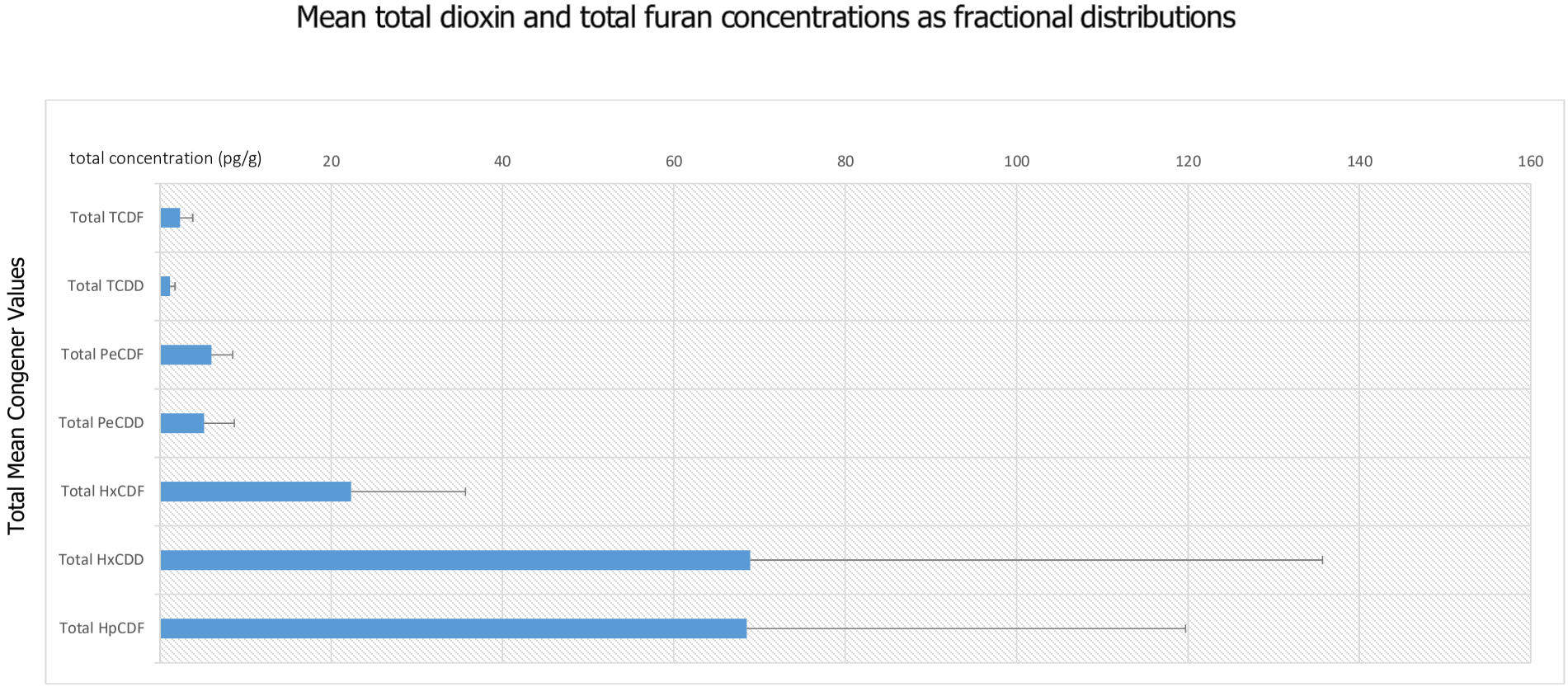
CDD = chlorinated dibenzo-p-dioxins
CDF = chlorinated dibenzofurans

Pe = penta
pg/g = picogram per gram
T = tetra

Task Order #: 68HE0919F0113

DCN: 0035-08-AAJD

Figure 8
Guam Chlorinated Herbicide Investigation
October 2019 Sampling Event
Guam



Notes:
Hx = hexa
Hp = hepta
O = octa
Pe = penta
T = tetra
CDD = chlorinated dibenzo-p-dioxins
CDF = chlorinated dibenzofurans
* Total HpCDD was excluded due to these congeners being known byproducts of combustion

Task Order #: 68HE0919F0113

DCN: 0035-08-AAJD

ATTACHMENT D: SAMPLING RESULTS

Table 1
Summary of Chlorinated Herbicides Analytical Data - Soil Samples
Chlorinated Herbicides Site Investigation
Guam

	G-01-01	G-01-01-D Duplicate of G-01-01	G-02-01	G-02-02	G-02-03	G-03-01	G-03-02	G-04-01	G-04-02	G-04-02-D Duplicate of G-04-02
	10/02/2019	10/02/2019	10/02/2019	10/02/2019	10/02/2019	10/02/2019	10/02/2019	10/04/2019	10/04/2019	10/04/2019
rface)	0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25
PESL restriced d Usage) mg/kg)	Chlorinated Herbicides - Soil - (mg/kg)									
12	ND (<0.0076)	ND (<0.0077)	ND (<0.0071)	ND (<0.0061)	ND (<0.0078)	ND (<0.006)	ND (<0.0061)	ND (<0.0064)	ND (<0.006)	ND (<0.0063)
0.34	ND (<0.0076)	ND (<0.0077)	ND (<0.0071)	ND (<0.0061)	ND (<0.0078)	ND (<0.006)	ND (<0.0061)	ND (<0.0064)	ND (<0.006)	ND (<0.0063)
--	ND (<0.018) J	ND (<0.018)	ND (<0.017)	ND (<0.015)	ND (<0.019)	ND (<0.014)	ND (<0.015)	ND (<0.015)	ND (<0.014)	ND (<0.015)
--	ND (<0.0091) J	ND (<0.0092)	ND (<0.0086)	ND (<0.0073)	ND (<0.0094)	ND (<0.0072)	ND (<0.0074)	ND (<0.0077)	ND (<0.0072)	ND (<0.0076)
--	ND (<0.0076)	ND (<0.0077)	ND (<0.0071)	ND (<0.0061)	ND (<0.0078)	ND (<0.006)	ND (<0.0061)	ND (<0.0064)	ND (<0.006)	ND (<0.0063)
--	ND (<0.0076)	ND (<0.0077)	ND (<0.0071)	ND (<0.0061)	ND (<0.0078)	ND (<0.006)	ND (<0.0061)	ND (<0.0064)	ND (<0.006)	ND (<0.0063)
--	ND (<0.0076)	ND (<0.0077)	ND (<0.0071)	ND (<0.0061)	ND (<0.0078)	ND (<0.006)	ND (<0.0061)	ND (<0.0064)	ND (<0.006)	ND (<0.0063)
0.87	ND (<0.0076)	ND (<0.0077)	ND (<0.0071)	ND (<0.0061)	ND (<0.0078)	ND (<0.006)	ND (<0.0061)	ND (<0.0064)	ND (<0.006)	ND (<0.0063)

Analytical result exceeds screening levels
limit (<RL)
n Agency Regional Screening Levels for residential soil (November 2019)
ntal Screening Levels for unrestricted land use in shallow soil where groundwater is not a
rce (2017)

n approximate value because the analyte concentration is below the reporting limit and above

Table 2
Summary of Dioxins and Furans Analytical Data - Soil Samples
Chlorinated Herbicide Site Investigation
Guam

		G-01-01	G-01-01-D Duplicate of G-01-01	G-02-01	G-02-02	G-02-03	G-03-01	G-03-02	G-04-01	G-04-02	G-04-02-D Duplicate of G-04-02
		10/02/2019	10/02/2019	10/02/2019	10/02/2019	10/02/2019	10/02/2019	10/02/2019	10/04/2019	10/04/2019	10/04/2019
		0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25	0 - 0.25
L al)	TPESL (Unrestriced Land Usage) (pg/g)	Dioxins and Furans - Soil - (pg/g)									
480	--	210 J	250	170	49	200	140	150	**670**	190	230
488	--	15	18	22	ND (<6.4)	58	13	19	51	29	35
488	--	ND (<7.7)	1 J	1.1 J	2.1 J	3.1 J	0.63 J	0.57 J	1.6 J	1 J	2 J
49	--	ND (<7.7)	ND (<8.1)	ND (<6.9)	ND (<6.4)	ND (<8.2)	ND (<6.6)	ND (<6.3)	ND (<6.8)	ND (<6.6)	ND (<6.8)
48	--	0.9 J	1.2 J	0.86 J	1.1 J	2.1 J	0.52 J	0.68 J	1.9 J	1.6 J	2.2 J
49	--	7.6 J	9.6	5.7 J	2.6 J	5.4 J	3.1 J	4.4 J	11	6.5 J	8.1
48	--	0.62 J	0.7 J	0.43 J	0.79 J	1.9 J	0.35 J	0.49 J	1.1 J	0.95 J	1.5 J
49	--	7.2 J	8.1	2.5 J	3 J	5.9 J	3.5 J	4 J	7	6.3 J	7.2
49	--	ND (<7.7)	ND (<8.1)	ND (<6.9) J	ND (<6.4)	ND (<8.2)	ND (<6.6)	ND (<6.3) J	ND (<6.8)	ND (<6.6) J	ND (<6.8)
4.9	--	1.4 J	1.5 J	0.42 J	0.63 J	1.3 J	0.63 J	0.78 J	1.3 J	1.1 J	1.3 J
164	--	0.34 J	0.31 J	0.19 J	0.35 J	0.42 J	0.16 J	0.3 J	0.7 J	0.54 J	0.58 J
49	--	ND (<7.7)	ND (<8.1)	ND (<6.9)	ND (<6.4)	ND (<8.2)	ND (<6.6)	ND (<6.3)	ND (<6.8)	ND (<6.6)	ND (<6.8)
16	--	ND (<7.7)	0.33 J	0.27 J	0.59 J	0.61 J	0.19 J	0.28 J	0.66 J	0.51 J	0.68 J
4.8	--	ND (<1.5)	0.19 J	0.17 J	0.17 J	0.6 J	1.3	1.6 J	ND (<1.4)	0.14 J	0.23 J
48	--	0.32 J	0.26 J	0.35 J	0.5 J	0.28 J	0.69 J	0.75 J	0.78 J	0.61 J	0.77 J
400	--	1,700 J	1,900	1,500	280	1,700	1,000	1,200	4,100	1,500	1,900
400	--	30	29	59	16	130	33	32	170	45	62
--	--	390	450	320	98	640	290	290	2,900	550	680
--	--	39	40	62	13 J	130	30	39	180	68 J	84
--	--	49	55	32	21 J	62	30 J	33	250	72	85
--	--	16 J	17 J	18 J	6.8	37	7.5	12 J	44 J	27 J	38
--	--	3.4 J	4.3 J	2.2 J	3.4 J	5.6 J	1.5 J	1.7 J	12 J	8 J	9.4 J
--	--	3.6 J	6.9 J	2.8 J	2.4 J	6.1 J	4.8 J	8.4	9.3 J	7.6 J	8.3 J
--	--	ND (<1.5)	0.41 J	0.59 J	0.71 J	1.4 J	2.1 J	2 J	1.1 J	1.1 J	1.4 J
--	--	0.62 J	0.87 J	0.98 J	1.8 J	1.6 J	3.3 J	5.2	3.2 J	2.8 J	3.5 J
4.8	480	**9.2**	**7.4**	4.6	3.4	**7.7**	**5.1**	**6**	**13**	**6.3**	**7.5**

ical result exceeds screening levels

Summary of Dioxins and Furans TEQ Calculations
Chlorinated Herbicides Site Investigation
Guam

EPA Advanced KM TEQ Calculator

Advanced KM TEQ calculator for performing quasi-sensitivity analyses

Project Name: TCEQ Case Study - Mammal TEFs (Human equivalents)
Matrix: Soil | **Data entered by:** TCEQ
Units: ng/kg | **Date entered:** 12/2/2015

protect/unprotect sheet password = dioxin

SITE DATA

Sample notes	Chemical Sort Order:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Summary of Sensitivity Analysis (relative percent difference)	TEQs from Substitution			KM Method		
	WHO 2005 TEFs =	1	1	0.1	0.1	0.1	0.01	0.0003	0.1	0.03	0.3	0.1	0.1	0.1	0.1	0.01	0.01	0.0003							
	Sample ID: (must enter on Row A)	TCDD	PeCDD	1,4-HxCDD	1,6-HxCDD	1,9-HxCDD	1,4,6-HpCDD	OCDD	TCDF	1-PeCDF	4-PeCDF	1,4-HxCDF	1,6-HxCDF	1,8-HxCDF	4,6-HxCDF	1,4,6-HpCDF	1,4,9-HpCDF	OCDF		U = 0 & sum	U = 1/2 DL & sum	U = DL & sum	Sample KM TEQ	Qualifier	Select KM TEQ
1	G-01-01: Row A	1.5 U	1.4 J	7.7 U	7.6 J	7.2 J	210 J	1700 J	0.32 J	0.34 J	7.7 U	0.9 J	0.62 J	7.7 U	7.7 U	15	7.7 U	30							
	value to use: Row B	1.5	1.4	7.7	7.6	7.2	210	1700	0.32	0.34	7.7	0.9	0.62	7.7	7.7	15	7.7	30							
	congener TEC: Row C	1.5	1.4	0.77	0.76	0.72	2.1	0.51	0.032	0.0102	2.31	0.09	0.062	0.77	0.77	0.15	0.077	0.009	69%	5.8432	8.9417	12.0402	9.2132	J	Section 2, Treatment 1
	donor value to use: Row D																								
	donor TEC: Row E																								
2	G-02-01: Row A	0.17 J	0.42 J	6.9 U	5.7 J	2.5 J	170	1500	0.35 J	0.19 J	0.27 J	0.86 J	0.43 J	6.9 U	6.9 U	22	1.1 J	59							
	value to use: Row B	0.17	0.42	6.9	5.7	2.5	170	1500	0.35	0.19	0.27	0.86	0.43	6.9	6.9	22	1.1	59							
	congener TEC: Row C	0.17	0.42	0.69	0.57	0.25	1.7	0.45	0.035	0.0057	0.081	0.086	0.043	0.69	0.69	0.22	0.011	0.0177	41%	4.0594	5.0944	6.1294	4.6039	J	Section 1
	donor value to use: Row D																								
	donor TEC: Row E																								
3	G-02-02: Row A	0.17 J	0.63 J	6.4 U	2.6 J	3 J	49	280	0.5 J	0.35 J	0.59 J	1.1 J	0.79 J	6.4 U	6.4 U	6.4 U	2.1 J	16							
	value to use: Row B	0.17	0.63	6.4	2.6	3	49	280	0.5	0.35	0.59	1.1	0.79	6.4	6.4	6.4	2.1	16							
	congener TEC: Row C	0.17	0.63	0.64	0.26	0.3	0.49	0.084	0.05	0.0105	0.177	0.11	0.079	0.64	0.64	0.064	0.021	0.0048	59%	2.3863	3.3783	4.3703	3.3919	J	Section 2, Treatment 1
	donor value to use: Row D																								
	donor TEC: Row E																								
4	G-02-03: Row A	0.6 J	1.3 J	8.2 U	5.4 J	5.9 J	200	1700	0.28 J	0.42 J	0.61 J	2.1 J	1.9 J	8.2 U	8.2 U	58	3.1 J	130							
	value to use: Row B	0.6	1.3	8.2	5.4	5.9	200	1700	0.28	0.42	0.61	2.1	1.9	8.2	8.2	58	3.1	130							
	congener TEC: Row C	0.6	1.3	0.82	0.54	0.59	2	0.51	0.028	0.0126	0.183	0.21	0.19	0.82	0.82	0.58	0.031	0.039	31%	6.8136	8.0436	9.2736	7.6920	J	Section 1
	donor value to use: Row D																								
	donor TEC: Row E																								
5	G-03-01: Row A	1.3	0.63 J	6.6 U	3.1 J	3.5 J	140	1000	0.69 J	0.16 J	0.19 J	0.52 J	0.35 J	6.6 U	6.6 U	13	0.63 J	33							
	value to use: Row B	1.3	0.63	6.6	3.1	3.5	140	1000	0.69	0.16	0.19	0.52	0.35	6.6	6.6	13	0.63	33							
	congener TEC: Row C	1.3	0.63	0.66	0.31	0.35	1.4	0.3	0.069	0.0048	0.057	0.052	0.035	0.66	0.66	0.13	0.0063	0.0099	35%	4.654	5.644	6.634	5.1425	J	Section 1
	donor value to use: Row D																								
	donor TEC: Row E																								
6	G-03-02: Row A	1.6 J	0.78 J	6.3 U	4.4 J	4 J	150	1200	0.75 J	0.3 J	0.28 J	0.68 J	0.49 J	6.3 U	6.3 U	19	0.57 J	32							
	value to use: Row B	1.6	0.78	6.3	4.4	4	150	1200	0.75	0.3	0.28	0.68	0.49	6.3	6.3	19	0.57	32							
	congener TEC: Row C	1.6	0.78	0.63	0.44	0.4	1.5	0.36	0.075	0.009	0.084	0.068	0.049	0.63	0.63	0.19	0.0057	0.0096	29%	5.5703	6.5153	7.4603	6.0313	J	Section 1
	donor value to use: Row D																								
	donor TEC: Row E																								
7	G-04-01: Row A	1.4 U	1.3 J	6.8 U	11	7	670	4100	0.78 J	0.7 J	0.66 J	1.9 J	1.1 J	6.8 U	6.8 U	51	1.6 J	170							
	value to use: Row B	1.4	1.3	6.8	11	7	670	4100	0.78	0.7	0.66	1.9	1.1	6.8	6.8	51	1.6	170							
	congener TEC: Row C	1.4	1.3	0.68	1.1	0.7	6.7	1.23	0.078	0.021	0.198	0.19	0.11	0.68	0.68	0.51	0.016	0.051	25%	12.2040	13.9240	15.6440	13.0405	none	Section 1
	donor value to use: Row D																								
	donor TEC: Row E																								
8	G-01-01-D: Row A	0.19 J	1.5 J	8.1 U	9.6	8.1	250	1900	0.26 J	0.31 J	0.33 J	1.2 J	0.7 J	8.1 U	8.1 U	18	1 J	29							
	value to use: Row B	0.19	1.5	8.1	9.6	8.1	250	1900	0.26	0.31	0.33	1.2	0.7	8.1	8.1	18	1	29							
	congener TEC: Row C	0.19	1.5	0.81	0.96	0.81	2.5	0.57	0.026	0.0093	0.099	0.12	0.07	0.81	0.81	0.18	0.01	0.0087	29%	7.0530	8.2680	9.4830	7.4379	none	Section 1
	donor value to use: Row D																								
	donor TEC: Row E																								
9	G-04-02: Row A	0.14 J	1.1 J	6.6 U	6.5 J	6.3 J	190	1500	0.61 J	0.54 J	0.51 J	1.6 J	0.95 J	6.6 U	6.6 U	29	1 J	45							
	value to use: Row B	0.14	1.1	6.6	6.5	6.3	190	1500	0.61	0.54	0.51	1.6	0.95	6.6	6.6	29	1	45							
	congener TEC: Row C	0.14	1.1	0.66	0.65	0.63	1.9	0.45	0.061	0.0162	0.153	0.16	0.095	0.66	0.66	0.29	0.01	0.0135	30%	5.6687	6.6587	7.6487	6.3359	J	Section 1
	donor value to use: Row D																								
	donor TEC: Row E																								
10	G-04-02-D: Row A	0.23 J	1.3 J	6.8 U	8.1	7.2	230	1900	0.77 J	0.58 J	0.68 J	2.2 J	1.5 J	6.8 U	6.8 U	35	2 J	62							
	value to use: Row B	0.23	1.3	6.8	8.1	7.2	230	1900	0.77	0.58	0.68	2.2	1.5	6.8	6.8	35	2	62							
	congener TEC: Row C	0.23	1.3	0.68	0.81	0.72	2.3	0.57	0.077	0.0174	0.204	0.22	0.15	0.68	0.68	0.35	0.02	0.0186	25%	6.9870	8.0070	9.0270	7.5441	none	Section 1
	donor value to use: Row D																								
	donor TEC: Row E																								

GUAM AGENT ORANGE SITE
DATA VALIDATION REPORT

Date: November 18, 2019
Laboratory: Eurofins TestAmerica, West Sacramento, CA
Laboratory Job Number: 320-55071-1
Data Validation Performed By: Tara Johnson, Weston Solutions, Inc. (WESTON) Superfund Technical Assessment and Response Team (START)
Data Validation Reviewed By: Kelly Luck, WESTON START
Weston Work Order #: 20905.012.025.0035.00

This data validation report has been prepared by WESTON START under the START V U.S. Environmental Protection Agency (EPA) Region 9 contract. This report documents the data validation for 10 soil samples collected for the Guam Agent Orange site that were analyzed for the following parameters and methods:

- Herbicides by SW-846 Method 8321A
- Dioxins and Furans by SW-846 Method 8290A

A level II data package was received from Eurofins TestAmerica, West Sacramento, CA. The data validation was conducted in general accordance with the EPA "Contract Laboratory Program National Functional Guidance for Superfund Organic Methods Data Review" dated January 2017 and the EPA "Contract Laboratory Program National Functional Guidance for High Resolution Superfund Methods Data Review" dated April 2016. The Attachment contains the results summary sheets with any hand-written qualifiers applied during data validation.

Only one sample container was received for sample G-01-01-D; the sample volume was split into two containers to allow the sample to be analyzed at separate laboratories.

The data package was revised on November 18, 2019 to correct the sample name for G-01-01-D.

HERBICIDES by SW-846 METHOD 8321A

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Prepared	Date Analyzed
G-04-02	320-55071-1	Solid	10/4/19	10/10/19	11/12/19
G-04-01	320-55071-2	Solid	10/4/19	10/10/19	11/12/19
G-04-02-D	320-55071-3	Solid	10/4/19	10/10/19	11/12/19
G-01-01-D	320-55071-4	Solid	10/2/19	10/10/19	11/12/19
G-01-01	320-55071-5	Solid	10/2/19	10/10/19	11/12/19
G-03-01	320-55071-6	Solid	10/2/19	10/10/19	11/12/19
G-03-02	320-55071-7	Solid	10/2/19	10/10/19	11/12/19
G-02-03	320-55071-8	Solid	10/2/19	10/10/19	11/12/19
G-02-02	320-55071-9	Solid	10/2/19	10/10/19	11/12/19

Samples	Lab ID	Matrix	Date Collected	Date Prepared	Date Analyzed
G-02-01	320-55071-10	Solid	10/2/19	10/10/19	11/12/19

Herbicides analyses were conducted by the Eurofins TestAmerica laboratory in Denver, CO.

1. Data Verification Check

A data verification and completeness check was performed in accordance with the Stage 1 and 2A verification checks outlined in the EPA "Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use" dated January 13, 2009. For the herbicides analyses, all analytical data package items were received from the laboratory and the analyses requested were performed.

2. Holding Times

The samples were received within the recommended temperature limit of ≤6 ºC and were extracted and analyzed within the recommended holding times of 14 days from sample collection to extraction and 40 days from extraction to analysis.

3. Blanks

One method blank was analyzed with the sample set and was free of target compound contamination above the method detection limits.

4. Surrogates

Surrogate recovery results were within laboratory-established quality control (QC) limits for all samples.

5. Laboratory Control Sample (LCS) Results

One LCS was analyzed with the sample set and the recoveries were within laboratory-established QC limits for all analytes.

6. Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results

Sample G-01-01 was used for MS and MSD analyses. Recoveries of all analytes were within laboratory-established QC limits with the exception of 2,4-DB (0% for MS and MSD) and dicamba (49%; MSD only). In addition, the relative percent differences (RPDs) were within QC limits for all analytes except 2,4-DB, for which RPD could not be calculated. The results for 2,4-DB and dicamba in sample G-01-01 were qualified as estimated (UJ).

7. Field Duplicate Results

The sample set included two field duplicate pairs:

- G-04-02 and G-04-02-D; and
- G-01-01 and G-01-01-D.

No herbicides were detected in either sample pair; therefore, RPDs could not be calculated.

8. Overall Assessment

In addition to the qualifiers discussed above, the data validator applied "U" qualifiers to sample results reported by the laboratory as "ND".

Eurofins TestAmerica flagged sample results with the following laboratory qualifier:

F1: Indicates MS and/or MSD recovery was outside acceptance limits. These qualifiers were removed by the data validator and "UJ" qualifiers were added.

The herbicides data are acceptable for use as qualified based on the information received.

DIOXINS and FURANS by SW-846 METHOD 8290A

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Prepared	Date Analyzed
G-04-02	320-55071-1	Solid	10/4/19	10/8/19	10/17/19
G-04-01	320-55071-2	Solid	10/4/19	10/8/19	10/17/19
G-04-02-D	320-55071-3	Solid	10/4/19	10/8/19	10/21/19
G-01-01-D	320-55071-4	Solid	10/2/19	10/8/19	10/18/19
G-01-01	320-55071-5	Solid	10/2/19	10/8/19	10/18/19
G-03-01	320-55071-6	Solid	10/2/19	10/8/19	10/18/19
G-03-02	320-55071-7	Solid	10/2/19	10/8/19	10/18/19
G-02-03	320-55071-8	Solid	10/2/19	10/8/19	10/18/19
G-02-02	320-55071-9	Solid	10/2/19	10/8/19	10/18/19
G-02-01	320-55071-10	Solid	10/2/19	10/8/19	10/18/19

1. Data Verification Check

A data verification and completeness check was performed in accordance with the Stage 1 and 2A verification checks outlined in the EPA "Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use" dated January 13, 2009. For the dioxins and furans analyses, all analytical data package items were received from the laboratory and the analyses requested were performed.

2. Holding Times

The samples were received within the recommended temperature limit of ≤6 ºC and were extracted and analyzed within the recommended holding time limits of 30 days from sample collection to extraction and 45 days from extraction to analysis.

3. Blanks

One method blank was analyzed with the sample set. The blank was free of target compound contamination above the estimated detection limits (EDLs) with the following exceptions, which were detected above the EDLs but below the reporting limits (RLs): 1,2,3,4,7,8-HxCDD (0.239 pg/g); 1,2,3,7,8,9-HxCDF (0.0802 pg/g); 2,3,4,6,7,8-HxCDF (0.0418 pg/g); 1,2,3,4,6,7,8-HpCDD (0.114 pg/g); 1,2,3,4,6,7,8-HpCDF (0.0727 pg/g); OCDD (0.726 pg/g); OCDF (0.200 pg/g); Total HxCDD (0.239 pg/g); Total HxCDF (0.122 pg/g); Total HpCDD (0.235 pg/g); and Total HpCDF (0.0727 pg/g).

For sample results in which the above analytes were found at levels greater than the EDL but less than the RL, results for those analytes were changed to nondetected (ND) with the RL as the limit of detection. This situation applied to the results for 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDF, and 2,3,4,6,7,8-HxCDF in all samples, except that in sample G-04-01, the analyte 1,2,3,7,8,9-HxCDF was not detected; therefore, no qualification was needed. This situation also applied to the results for 1,2,3,4,6,7,8-HpCDF in sample G-02-02.

No other qualification of data was needed as results for the affected analytes were above the RL and much greater than the amount found in the blank.

4. Surrogates

The surrogate (isotope dilution analyte) recovery results were within laboratory-established QC limits for all samples.

5. LCS Results

One LCS was analyzed with the sample set. All recoveries were within laboratory-established QC limits.

6. MS and MSD Results

Sample G-01-01 was used for MS/MSD analyses. The recoveries were within laboratory-established QC limits with the exception of 1,2,3,4,6,7,8-HpCDD (150%; MS only). The result for 1,2,3,4,6,7,8-HpCDD was qualified as estimated (J) in sample G-01-01.

Both recoveries for OCDD were also outside QC limits, but the concentration of OCDD in the unspiked sample was >4x the amount of the spiked concentration so no qualification was needed based on poor MS/MSD recovery. The RPD for OCDD was outside laboratory-established QC

limits (26%); therefore, the result for OCDD was qualified as estimated (J) in sample G-01-01 based on RPD.

7. Field Duplicate Results

The sample set included two field duplicate pairs:

- G-04-02 and G-04-02-D; and
- G-01-01 and G-01-01-D.

The RPDs were within QC limits (RPD ≤50%; or absolute difference <RL for results <5x RL) for all detected target analytes.

8. Overall Assessment

Elevated noise or matrix interferences for 1,2,3,4,6,7,8-HpCDD and Total HpCDD in sample G-04-01 caused elevation of the EDLs; the RLs were raised to match the EDLs.

In addition to the qualifiers discussed above, the data validator applied "U" qualifiers to sample results reported as "ND".

Eurofins TestAmerica flagged sample results with the following laboratory qualifiers:

J: Indicates the result is less than the RL but greater than or equal to the EDL and the concentration is an approximate value. The data validator left these qualifiers in place.

q: Indicates the reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference. These qualifiers were removed by the data validator and "J" or "UJ" qualifiers were added

B: Indicates compound was found in the blank and sample. These qualifiers were removed by the data validator. For sample results less than the RL, the result was changed to ND at the RL.

G: Indicates the reported quantitation limit has been raised due to an exhibited elevated noise or matrix interference. These qualifiers were removed by the data validator.

F1: Indicates MS and/or MSD recovery was outside acceptance limits. This qualifier was removed by the data validator and a "J" qualifier was added.

F2: Indicates MS/MSD RPD exceeds control limits. This qualifier was removed by the data validator and a "J" qualifier was added.

The dioxins and furans data are acceptable for use as qualified based on the information received.

ATTACHMENT

EUROFINS TESTAMERICA
RESULTS SUMMARY WITH QUALIFIERS

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-04-02
Date Collected: 10/04/19 11:20
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-1
Matrix: Solid
Percent Solids: 76.8

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND	U	0.0060	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
2,4-D	ND		0.0060	0.00073	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
2,4-DB	ND		0.014	0.0064	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
Dicamba	ND		0.0072	0.0034	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
Dichlorprop	ND		0.0060	0.00076	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
MCPA	ND		0.0060	0.00070	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
MCPP	ND		0.0060	0.00056	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
Silvex (2,4,5-TP)	ND		0.0060	0.00089	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*30*		*22 - 111*	*10/10/19 16:33*	*11/12/19 04:41*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.14	J q	1.3	0.062	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
2,3,7,8-TCDF	0.61	J	1.3	0.054	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,7,8-PeCDD	1.1	J	6.6	0.11	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,7,8-PeCDF	0.54	J	6.6	0.065	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
2,3,4,7,8-PeCDF	0.51	J q	6.6	0.066	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,4,7,8-HxCDD	ND ~~2.6~~	~~J B~~ U	6.6	0.16	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,6,7,8-HxCDD	6.5	J	6.6	0.14	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,7,8,9-HxCDD	6.3	J	6.6	0.14	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,4,7,8-HxCDF	1.6	J	6.6	0.15	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,6,7,8-HxCDF	0.95	J	6.6	0.14	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,7,8,9-HxCDF	ND ~~0.21~~	~~J q B~~ UJ	6.6	0.16	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
2,3,4,6,7,8-HxCDF	ND ~~1.1~~	~~J B~~ U	6.6	0.15	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,4,6,7,8-HpCDD	190	B	6.6	2.7	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,4,6,7,8-HpCDF	29	B	6.6	0.54	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,4,7,8,9-HpCDF	1.0	J q	6.6	0.66	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
OCDD	1500	B	13	0.84	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
OCDF	45	B	13	0.090	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total TCDD	1.1	J q	1.3	0.062	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total TCDF	2.8	q J	1.3	0.054	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total PeCDD	8.0	q J	6.6	0.11	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total PeCDF	7.6	q J	6.6	0.065	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total HxCDD	72	B	6.6	0.15	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total HxCDF	27	q B J	6.6	0.15	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total HpCDD	550	B	6.6	2.7	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total HpCDF	68	q B J	6.6	0.60	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*71*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-2,3,7,8-TCDF	*63*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-1,2,3,7,8-PeCDD	*70*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-1,2,3,7,8-PeCDF	*69*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-1,2,3,6,7,8-HxCDD	*58*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-1,2,3,4,7,8-HxCDF	*63*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*64*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*60*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-OCDD	*62*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*

TBJ 11/18/19

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-04-02

Lab Sample ID: 320-55071-1
Matrix: Solid
Percent Solids: 76.8

Date Collected: 10/04/19 11:20
Date Received: 10/07/19 09:05

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	23.2		0.1	0.1	%			10/14/19 16:37	1
Percent Solids	76.8		0.1	0.1	%			10/14/19 16:37	1

Client Sample ID: G-04-01

Lab Sample ID: 320-55071-2
Matrix: Solid
Percent Solids: 74.7

Date Collected: 10/04/19 11:18
Date Received: 10/07/19 09:05

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND	U	0.0064	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
2,4-D	ND		0.0064	0.00078	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
2,4-DB	ND		0.015	0.0068	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
Dicamba	ND		0.0077	0.0037	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
Dichlorprop	ND		0.0064	0.00081	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
MCPA	ND		0.0064	0.00074	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
MCPP	ND		0.0064	0.00060	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
Silvex (2,4,5-TP)	ND		0.0064	0.00095	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*47*		*22 - 111*	*10/10/19 16:33*	*11/12/19 04:47*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND	U	1.4	0.063	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
2,3,7,8-TCDF	0.78	J	1.4	0.054	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,7,8-PeCDD	1.3	J	6.8	0.11	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,7,8-PeCDF	0.70	J	6.8	0.067	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
2,3,4,7,8-PeCDF	0.66	J	6.8	0.069	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,4,7,8-HxCDD	ND 4.2	J B U	6.8	0.37	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,6,7,8-HxCDD	11		6.8	0.33	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,7,8,9-HxCDD	7.0		6.8	0.31	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,4,7,8-HxCDF	1.9	J q	6.8	0.20	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,6,7,8-HxCDF	1.1	J	6.8	0.19	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,7,8,9-HxCDF	ND	U	6.8	0.21	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
2,3,4,6,7,8-HxCDF	ND 4.2	J B U	6.8	0.19	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,4,6,7,8-HpCDD	670	G B	12	12	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,4,6,7,8-HpCDF	51	B	6.8	1.1	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,4,7,8,9-HpCDF	1.6	J	6.8	1.3	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
OCDD	4100	B	14	3.1	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
OCDF	170	B	14	0.12	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total TCDD	1.1	J q	1.4	0.063	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total TCDF	3.2	q J	1.4	0.054	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total PeCDD	12	q J	6.8	0.11	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total PeCDF	9.3	q J	6.8	0.068	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total HxCDD	250	B	6.8	0.34	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total HxCDF	44	q B J	6.8	0.20	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total HpCDD	2900	G B	12	12	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total HpCDF	180	B	6.8	1.2	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*68*		*40 - 135*	*10/08/19 14:09*	*10/17/19 23:41*	*1*

TBJ 11/18/19

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-04-01

Date Collected: 10/04/19 11:18
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-2
Matrix: Solid
Percent Solids: 74.7

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	60		40 - 135	10/08/19 14:09	10/17/19 23:41	1
13C-1,2,3,7,8-PeCDD	74		40 - 135	10/08/19 14:09	10/17/19 23:41	1
13C-1,2,3,7,8-PeCDF	68		40 - 135	10/08/19 14:09	10/17/19 23:41	1
13C-1,2,3,6,7,8-HxCDD	64		40 - 135	10/08/19 14:09	10/17/19 23:41	1
13C-1,2,3,4,7,8-HxCDF	64		40 - 135	10/08/19 14:09	10/17/19 23:41	1
13C-1,2,3,4,6,7,8-HpCDD	71		40 - 135	10/08/19 14:09	10/17/19 23:41	1
13C-1,2,3,4,6,7,8-HpCDF	64		40 - 135	10/08/19 14:09	10/17/19 23:41	1
13C-OCDD	67		40 - 135	10/08/19 14:09	10/17/19 23:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	25.3		0.1	0.1	%			10/14/19 16:37	1
Percent Solids	74.7		0.1	0.1	%			10/14/19 16:37	1

Client Sample ID: G-04-02-D

Date Collected: 10/04/19 11:35
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-3
Matrix: Solid
Percent Solids: 74.4

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND	U	0.0063	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
2,4-D	ND		0.0063	0.00077	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
2,4-DB	ND		0.015	0.0067	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
Dicamba	ND		0.0076	0.0036	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
Dichlorprop	ND		0.0063	0.00080	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
MCPA	ND		0.0063	0.00073	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
MCPP	ND		0.0063	0.00059	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
Silvex (2,4,5-TP)	ND		0.0063	0.00094	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	33		22 - 111	10/10/19 16:33	11/12/19 04:53	1

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.23	J	1.4	0.12	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
2,3,7,8-TCDF	0.77	J	1.4	0.097	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,7,8-PeCDD	1.3	J	6.8	0.25	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,7,8-PeCDF	0.58	J	6.8	0.11	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
2,3,4,7,8-PeCDF	0.68	J	6.8	0.11	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,4,7,8-HxCDD	ND 3.3	J B U	6.8	0.19	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,6,7,8-HxCDD	8.1		6.8	0.17	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,7,8,9-HxCDD	7.2		6.8	0.16	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,4,7,8-HxCDF	2.2	J	6.8	0.20	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,6,7,8-HxCDF	1.5	J	6.8	0.19	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,7,8,9-HxCDF	ND 0.62	J B U	6.8	0.21	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
2,3,4,6,7,8-HxCDF	ND 1.6	J B U	6.8	0.19	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,4,6,7,8-HpCDD	230	B	6.8	2.6	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,4,6,7,8-HpCDF	35	B	6.8	0.53	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,4,7,8,9-HpCDF	2.0	J	6.8	0.64	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
OCDD	1900	B	14	1.1	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
OCDF	62	B	14	0.18	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1

TBJ 11/18/19

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-04-02-D

Date Collected: 10/04/19 11:35
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-3
Matrix: Solid
Percent Solids: 74.4

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
Total TCDD	1.4	q J	1.4	0.12	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total TCDF	3.5	q J	1.4	0.097	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total PeCDD	9.4	q J	6.8	0.25	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total PeCDF	8.3	q J	6.8	0.11	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total HxCDD	85	B	6.8	0.17	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total HxCDF	38	B	6.8	0.20	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total HpCDD	680	B	6.8	2.6	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total HpCDF	84	B	6.8	0.59	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	68		40 - 135	10/08/19 14:09	10/21/19 22:24	1
13C-2,3,7,8-TCDF	62		40 - 135	10/08/19 14:09	10/21/19 22:24	1
13C-1,2,3,7,8-PeCDD	66		40 - 135	10/08/19 14:09	10/21/19 22:24	1
13C-1,2,3,7,8-PeCDF	71		40 - 135	10/08/19 14:09	10/21/19 22:24	1
13C-1,2,3,6,7,8-HxCDD	65		40 - 135	10/08/19 14:09	10/21/19 22:24	1
13C-1,2,3,4,7,8-HxCDF	72		40 - 135	10/08/19 14:09	10/21/19 22:24	1
13C-1,2,3,4,6,7,8-HpCDD	53		40 - 135	10/08/19 14:09	10/21/19 22:24	1
13C-1,2,3,4,6,7,8-HpCDF	54		40 - 135	10/08/19 14:09	10/21/19 22:24	1
13C-OCDD	46		40 - 135	10/08/19 14:09	10/21/19 22:24	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	25.6		0.1	0.1	%			10/14/19 16:37	1
Percent Solids	74.4		0.1	0.1	%			10/14/19 16:37	1

Client Sample ID: G-01-01-D

Date Collected: 10/02/19 10:50
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-4
Matrix: Solid
Percent Solids: 62.0

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND	U	0.0077	0.0014	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
2,4-D	ND		0.0077	0.00093	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
2,4-DB	ND		0.018	0.0081	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
Dicamba	ND		0.0092	0.0044	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
Dichlorprop	ND		0.0077	0.00096	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
MCPA	ND		0.0077	0.00089	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
MCPP	ND		0.0077	0.00072	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
Silvex (2,4,5-TP)	ND		0.0077	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	42		22 - 111	10/10/19 16:33	11/12/19 04:59	1

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.19	J q	1.6	0.053	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
2,3,7,8-TCDF	0.26	J	1.6	0.051	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,7,8-PeCDD	1.5	J	8.1	0.14	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,7,8-PeCDF	0.31	J	8.1	0.065	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
2,3,4,7,8-PeCDF	0.33	J	8.1	0.067	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,4,7,8-HxCDD	ND ~~3.5~~	J B U	8.1	0.17	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1

TBJ 11/18/19

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-01-01-D

Date Collected: 10/02/19 10:50
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-4
Matrix: Solid
Percent Solids: 62.0

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,6,7,8-HxCDD	9.6		8.1	0.15	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,7,8,9-HxCDD	8.1		8.1	0.14	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,4,7,8-HxCDF	1.2	J	8.1	0.086	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,6,7,8-HxCDF	0.70	J	8.1	0.081	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,7,8,9-HxCDF	ND 0.27	J B U	8.1	0.089	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
2,3,4,6,7,8-HxCDF	ND 0.78	J B U	8.1	0.083	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,4,6,7,8-HpCDD	250	B	8.1	2.9	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,4,6,7,8-HpCDF	18	B	8.1	0.23	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,4,7,8,9-HpCDF	1.0	J	8.1	0.28	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
OCDD	1900	B	16	1.3	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
OCDF	29	B	16	0.084	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total TCDD	0.41	J q	1.6	0.053	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total TCDF	0.87	J q	1.6	0.051	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total PeCDD	4.3	J q	8.1	0.14	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total PeCDF	6.9	J q	8.1	0.066	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total HxCDD	55	B	8.1	0.15	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total HxCDF	17	q B J	8.1	0.085	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total HpCDD	450	B	8.1	2.9	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total HpCDF	40	B	8.1	0.25	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*68*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-2,3,7,8-TCDF	*60*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-1,2,3,7,8-PeCDD	*71*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-1,2,3,7,8-PeCDF	*65*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-1,2,3,6,7,8-HxCDD	*61*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-1,2,3,4,7,8-HxCDF	*65*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*68*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*63*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-OCDD	*66*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	38.0		0.1	0.1	%			10/10/19 17:32	1
Percent Solids	62.0		0.1	0.1	%			10/10/19 17:32	1

Client Sample ID: G-01-01

Date Collected: 10/02/19 10:05
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-5
Matrix: Solid
Percent Solids: 65.5

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND	U	0.0076	0.0013	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
2,4-D	ND	U	0.0076	0.00092	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
2,4-DB	ND	F1 UJ	0.018	0.0080	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
Dicamba	ND	F1 UJ	0.0091	0.0043	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
Dichlorprop	ND	U	0.0076	0.00095	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
MCPA	ND	U	0.0076	0.00088	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
MCPP	ND	U	0.0076	0.00071	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
Silvex (2,4,5-TP)	ND	U	0.0076	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1

TBJ 11/18/19

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-01-01
Date Collected: 10/02/19 10:05
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-5
Matrix: Solid
Percent Solids: 65.5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	33		22 - 111	10/10/19 16:33	11/12/19 05:05	1

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND	U	1.5	0.13	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
2,3,7,8-TCDF	0.32	J	1.5	0.10	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,7,8-PeCDD	1.4	J	7.7	0.26	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,7,8-PeCDF	0.34	J	7.7	0.13	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
2,3,4,7,8-PeCDF	ND	U	7.7	0.13	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,4,7,8-HxCDD	ND ~~3.2~~	~~J B~~ U	7.7	0.25	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,6,7,8-HxCDD	7.6	J	7.7	0.22	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,7,8,9-HxCDD	7.2	J	7.7	0.21	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,4,7,8-HxCDF	0.90	J	7.7	0.16	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,6,7,8-HxCDF	0.62	J	7.7	0.15	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,7,8,9-HxCDF	ND ~~0.43~~	~~J B~~ U	7.7	0.17	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
2,3,4,6,7,8-HxCDF	ND ~~0.70~~	~~J B~~ U	7.7	0.16	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,4,6,7,8-HpCDD	210	~~B F1~~ J	7.7	2.6	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,4,6,7,8-HpCDF	15	~~B~~	7.7	0.37	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,4,7,8,9-HpCDF	ND	U	7.7	0.45	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
OCDD	1700	~~B F2~~ J	15	1.7	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
OCDF	30	~~B~~	15	0.17	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total TCDD	ND	U	1.5	0.13	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total TCDF	0.62	J ~~q~~	1.5	0.10	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total PeCDD	3.4	J ~~q~~	7.7	0.26	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total PeCDF	3.6	J ~~q~~	7.7	0.13	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total HxCDD	49	~~B~~	7.7	0.23	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total HxCDF	16	~~q B~~ J	7.7	0.16	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total HpCDD	390	~~B~~	7.7	2.6	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total HpCDF	39	~~B~~	7.7	0.41	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	71		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-2,3,7,8-TCDF	64		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-1,2,3,7,8-PeCDD	73		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-1,2,3,7,8-PeCDF	68		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-1,2,3,6,7,8-HxCDD	61		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-1,2,3,4,7,8-HxCDF	61		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-1,2,3,4,6,7,8-HpCDD	68		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-1,2,3,4,6,7,8-HpCDF	59		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-OCDD	60		40 - 135	10/08/19 14:09	10/18/19 05:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	34.5		0.1	0.1	%			10/11/19 16:06	1
Percent Solids	65.5		0.1	0.1	%			10/11/19 16:06	1

TEJ 11/18/19

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-03-01
Date Collected: 10/02/19 14:55
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-6
Matrix: Solid
Percent Solids: 75.6

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND	U	0.0060	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
2,4-D	ND		0.0060	0.00073	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
2,4-DB	ND		0.014	0.0064	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
Dicamba	ND		0.0072	0.0034	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
Dichlorprop	ND		0.0060	0.00076	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
MCPA	ND		0.0060	0.00070	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
MCPP	ND		0.0060	0.00057	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
Silvex (2,4,5-TP)	ND		0.0060	0.00089	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*32*		*22 - 111*	*10/10/19 16:33*	*11/12/19 05:23*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	1.3		1.3	0.051	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
2,3,7,8-TCDF	0.69	J	1.3	0.047	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,7,8-PeCDD	0.63	J	6.6	0.052	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,7,8-PeCDF	0.16	J q	6.6	0.051	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
2,3,4,7,8-PeCDF	0.19	J	6.6	0.052	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,4,7,8-HxCDD	ND 1.6	J B U	6.6	0.091	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,6,7,8-HxCDD	3.1	J	6.6	0.080	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,7,8,9-HxCDD	3.5	J	6.6	0.077	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,4,7,8-HxCDF	0.52	J	6.6	0.062	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,6,7,8-HxCDF	0.35	J	6.6	0.058	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,7,8,9-HxCDF	ND 0.21	J B U	6.6	0.064	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
2,3,4,6,7,8-HxCDF	ND 0.37	J B U	6.6	0.060	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,4,6,7,8-HpCDD	140	B	6.6	1.5	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,4,6,7,8-HpCDF	13	B	6.6	0.16	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,4,7,8,9-HpCDF	0.63	J	6.6	0.20	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
OCDD	1000	B	13	0.74	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
OCDF	33	B	13	0.058	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total TCDD	2.1	q J	1.3	0.051	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total TCDF	3.3	q J	1.3	0.047	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total PeCDD	1.5	J q	6.6	0.052	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total PeCDF	4.8	J q	6.6	0.051	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total HxCDD	30	q B J	6.6	0.083	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total HxCDF	7.5	B	6.6	0.061	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total HpCDD	290	B	6.6	1.5	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total HpCDF	30	B	6.6	0.18	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*69*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-2,3,7,8-TCDF	*59*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-1,2,3,7,8-PeCDD	*76*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-1,2,3,7,8-PeCDF	*68*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-1,2,3,6,7,8-HxCDD	*63*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-1,2,3,4,7,8-HxCDF	*65*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*73*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*67*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-OCDD	*67*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*

TEJ 11/18/19

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-03-01

Date Collected: 10/02/19 14:55
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-6
Matrix: Solid
Percent Solids: 75.6

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	24.4		0.1	0.1	%			10/11/19 16:06	1
Percent Solids	75.6		0.1	0.1	%			10/11/19 16:06	1

Client Sample ID: G-03-02

Date Collected: 10/02/19 15:10
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-7
Matrix: Solid
Percent Solids: 79.0

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND	U	0.0061	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
2,4-D	ND		0.0061	0.00075	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
2,4-DB	ND		0.015	0.0065	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
Dicamba	ND		0.0074	0.0035	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
Dichlorprop	ND		0.0061	0.00077	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
MCPA	ND		0.0061	0.00071	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
MCPP	ND		0.0061	0.00058	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
Silvex (2,4,5-TP)	ND		0.0061	0.00091	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*35*		*22 - 111*	*10/10/19 16:33*	*11/12/19 05:36*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	1.6	q J	1.3	0.051	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,7,8-PeCDD	0.78	J	6.3	0.093	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,7,8-PeCDF	0.30	J	6.3	0.087	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
2,3,4,7,8-PeCDF	0.28	J	6.3	0.090	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,4,7,8-HxCDD	ND 1.6	J B U	6.3	0.11	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,6,7,8-HxCDD	4.4	J	6.3	0.093	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,7,8,9-HxCDD	4.0	J	6.3	0.090	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,4,7,8-HxCDF	0.68	J	6.3	0.084	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,6,7,8-HxCDF	0.49	J	6.3	0.079	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,7,8,9-HxCDF	ND 0.21	J q B	6.3	0.087	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
2,3,4,6,7,8-HxCDF	ND 0.59	J B U	6.3	0.081	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,4,6,7,8-HpCDD	150	B	6.3	1.9	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,4,6,7,8-HpCDF	19	B	6.3	0.23	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,4,7,8,9-HpCDF	0.57	J	6.3	0.28	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
OCDD	1200	B	13	0.87	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
OCDF	32	B	13	0.055	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total TCDD	2.0	q J	1.3	0.051	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total TCDF	5.2		1.3	0.050	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total PeCDD	1.7	J q	6.3	0.093	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total PeCDF	8.4		6.3	0.088	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total HxCDD	33	B	6.3	0.097	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total HxCDF	12	q B J	6.3	0.083	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total HpCDD	290	B	6.3	1.9	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total HpCDF	39	B	6.3	0.26	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*66*		*40 - 135*	*10/08/19 14:09*	*10/18/19 08:39*	*1*
13C-2,3,7,8-TCDF	*58*		*40 - 135*	*10/08/19 14:09*	*10/18/19 08:39*	*1*

TBJ 11/18/19

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-03-02

Date Collected: 10/02/19 15:10
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-7
Matrix: Solid
Percent Solids: 79.0

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,7,8-PeCDD	72		40 - 135	10/08/19 14:09	10/18/19 08:39	1
13C-1,2,3,7,8-PeCDF	64		40 - 135	10/08/19 14:09	10/18/19 08:39	1
13C-1,2,3,6,7,8-HxCDD	61		40 - 135	10/08/19 14:09	10/18/19 08:39	1
13C-1,2,3,4,7,8-HxCDF	64		40 - 135	10/08/19 14:09	10/18/19 08:39	1
13C-1,2,3,4,6,7,8-HpCDD	69		40 - 135	10/08/19 14:09	10/18/19 08:39	1
13C-1,2,3,4,6,7,8-HpCDF	65		40 - 135	10/08/19 14:09	10/18/19 08:39	1
13C-OCDD	64		40 - 135	10/08/19 14:09	10/18/19 08:39	1

Method: 8290A - Dioxins and Furans (HRGC/HRMS) - RA

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.75	J	1.3	0.48	pg/g	☼	10/08/19 14:09	10/18/19 18:49	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	67		40 - 135	10/08/19 14:09	10/18/19 18:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	21.0		0.1	0.1	%			10/10/19 17:32	1
Percent Solids	79.0		0.1	0.1	%			10/10/19 17:32	1

Client Sample ID: G-02-03

Date Collected: 10/02/19 11:29
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-8
Matrix: Solid
Percent Solids: 62.0

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND	U	0.0078	0.0014	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
2,4-D	ND		0.0078	0.00096	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
2,4-DB	ND		0.019	0.0083	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
Dicamba	ND		0.0094	0.0045	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
Dichlorprop	ND		0.0078	0.00099	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
MCPA	ND		0.0078	0.00091	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
MCPP	ND		0.0078	0.00074	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
Silvex (2,4,5-TP)	ND		0.0078	0.0012	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	37		22 - 111	10/10/19 16:33	11/12/19 05:42	1

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.60	J	1.6	0.055	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
2,3,7,8-TCDF	0.28	J	1.6	0.039	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,7,8-PeCDD	1.3	J	8.2	0.13	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,7,8-PeCDF	0.42	J	8.2	0.091	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
2,3,4,7,8-PeCDF	0.61	J	8.2	0.094	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,4,7,8-HxCDD	ND ~~3.3 J B~~ U		8.2	0.14	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,6,7,8-HxCDD	5.4	J	8.2	0.12	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,7,8,9-HxCDD	5.9	J	8.2	0.11	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,4,7,8-HxCDF	2.1	J	8.2	0.16	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,6,7,8-HxCDF	1.9	J	8.2	0.15	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,7,8,9-HxCDF	ND ~~0.91 J B~~ U		8.2	0.17	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
2,3,4,6,7,8-HxCDF	ND ~~2.2 J B~~ U		8.2	0.16	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1

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Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-02-03

Date Collected: 10/02/19 11:29
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-8
Matrix: Solid
Percent Solids: 62.0

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	200	B	8.2	3.3	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,4,6,7,8-HpCDF	58	B	8.2	0.66	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,4,7,8,9-HpCDF	3.1	J	8.2	0.80	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
OCDD	1700	B	16	1.1	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
OCDF	130	B	16	0.12	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total TCDD	1.4	J q	1.6	0.055	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total TCDF	1.6	q J	1.6	0.039	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total PeCDD	5.6	J q	8.2	0.13	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total PeCDF	6.1	J q	8.2	0.092	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total HxCDD	62	B	8.2	0.12	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total HxCDF	37	B	8.2	0.16	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total HpCDD	640	B	8.2	3.3	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total HpCDF	130	B	8.2	0.73	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*68*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-2,3,7,8-TCDF	*59*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-1,2,3,7,8-PeCDD	*71*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-1,2,3,7,8-PeCDF	*64*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-1,2,3,6,7,8-HxCDD	*58*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-1,2,3,4,7,8-HxCDF	*60*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*63*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*55*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-OCDD	*54*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	38.0		0.1	0.1	%			10/10/19 17:32	1
Percent Solids	62.0		0.1	0.1	%			10/10/19 17:32	1

Client Sample ID: G-02-02

Date Collected: 10/02/19 11:06
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-9
Matrix: Solid
Percent Solids: 78.9

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND	U	0.0061	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
2,4-D	ND		0.0061	0.00075	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
2,4-DB	ND		0.015	0.0065	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
Dicamba	ND		0.0073	0.0035	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
Dichlorprop	ND		0.0061	0.00077	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
MCPA	ND		0.0061	0.00071	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
MCPP	ND		0.0061	0.00057	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
Silvex (2,4,5-TP)	ND		0.0061	0.00091	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*37*		*22 - 111*	*10/10/19 16:33*	*11/12/19 05:48*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.17	J q	1.3	0.041	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1

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Client Sample ID: G-02-02
Date Collected: 10/02/19 11:06
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-9
Matrix: Solid
Percent Solids: 78.9

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.50	J	1.3	0.033	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,7,8-PeCDD	0.63	J	6.4	0.097	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,7,8-PeCDF	0.35	J	6.4	0.042	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
2,3,4,7,8-PeCDF	0.59	J	6.4	0.043	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,4,7,8-HxCDD	ND ~~1.6~~	~~J B~~ U	6.4	0.096	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,6,7,8-HxCDD	2.6	J	6.4	0.084	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,7,8,9-HxCDD	3.0	J	6.4	0.081	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,4,7,8-HxCDF	1.1	J	6.4	0.056	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,6,7,8-HxCDF	0.79	J	6.4	0.052	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,7,8,9-HxCDF	ND ~~1.1~~	~~J B~~ U	6.4	0.058	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
2,3,4,6,7,8-HxCDF	ND ~~0.84~~	~~J B~~ U	6.4	0.054	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,4,6,7,8-HpCDD	49	B	6.4	0.55	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,4,6,7,8-HpCDF	ND ~~5.2~~	~~J B~~ U	6.4	0.13	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,4,7,8,9-HpCDF	2.1	J q	6.4	0.15	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
OCDD	280	B	13	0.22	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
OCDF	16	B	13	0.066	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total TCDD	0.71	J q	1.3	0.041	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total TCDF	1.8	q J	1.3	0.033	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total PeCDD	3.4	J q	6.4	0.097	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total PeCDF	2.4	J q	6.4	0.043	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total HxCDD	21	q B J	6.4	0.087	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total HxCDF	6.8	B	6.4	0.055	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total HpCDD	98	B	6.4	0.55	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total HpCDF	13	q B J	6.4	0.14	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*66*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-2,3,7,8-TCDF	*59*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-1,2,3,7,8-PeCDD	*68*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-1,2,3,7,8-PeCDF	*62*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-1,2,3,6,7,8-HxCDD	*55*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-1,2,3,4,7,8-HxCDF	*59*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*59*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*53*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-OCDD	*49*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	21.1		0.1	0.1	%			10/10/19 17:32	1
Percent Solids	78.9		0.1	0.1	%			10/10/19 17:32	1

Client Sample ID: G-02-01
Date Collected: 10/02/19 10:43
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-10
Matrix: Solid
Percent Solids: 70.0

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND	U	0.0071	0.0013	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1
2,4-D	ND	U	0.0071	0.00087	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1
2,4-DB	ND	U	0.017	0.0076	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1
Dicamba	ND	U	0.0086	0.0041	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1

TBJ 11/18/19

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-02-01
Date Collected: 10/02/19 10:43
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-10
Matrix: Solid
Percent Solids: 70.0

Method: 8321A - Herbicides (LC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorprop	ND	U	0.0071	0.00090	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1
MCPA	ND	U	0.0071	0.00083	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1
MCPP	ND	U	0.0071	0.00067	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1
Silvex (2,4,5-TP)	ND	U	0.0071	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*40*		*22 - 111*	*10/10/19 16:33*	*11/12/19 05:54*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.17	J q	1.4	0.042	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
2,3,7,8-TCDF	0.35	J	1.4	0.038	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,7,8-PeCDD	0.42	J	6.9	0.073	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,7,8-PeCDF	0.19	J	6.9	0.049	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
2,3,4,7,8-PeCDF	0.27	J	6.9	0.051	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,4,7,8-HxCDD	ND 1.3	J B U	6.9	0.14	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,6,7,8-HxCDD	5.7	J	6.9	0.12	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,7,8,9-HxCDD	2.5	J	6.9	0.12	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,4,7,8-HxCDF	0.86	J	6.9	0.14	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,6,7,8-HxCDF	0.43	J	6.9	0.13	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,7,8,9-HxCDF	ND 0.29	J q B	U J 6.9	0.14	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
2,3,4,6,7,8-HxCDF	ND 0.64	J B	U 6.9	0.13	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,4,6,7,8-HpCDD	170	B	6.9	2.0	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,4,6,7,8-HpCDF	22	B	6.9	0.32	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,4,7,8,9-HpCDF	1.1	J	6.9	0.39	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
OCDD	1500	B	14	1.1	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
OCDF	59	B	14	0.080	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total TCDD	0.59	J q	1.4	0.042	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total TCDF	0.98	J q	1.4	0.038	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total PeCDD	2.2	J q	6.9	0.073	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total PeCDF	2.8	J q	6.9	0.050	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total HxCDD	32	B	6.9	0.13	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total HxCDF	18	q B J	6.9	0.13	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total HpCDD	320	B	6.9	2.0	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total HpCDF	62	B	6.9	0.35	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*61*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-2,3,7,8-TCDF	*55*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-1,2,3,7,8-PeCDD	*62*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-1,2,3,7,8-PeCDF	*58*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-1,2,3,6,7,8-HxCDD	*53*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-1,2,3,4,7,8-HxCDF	*54*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*56*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*49*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-OCDD	*47*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	30.0		0.1	0.1	%			10/14/19 09:51	1
Percent Solids	70.0		0.1	0.1	%			10/14/19 09:51	1

TBJ 11/18/19

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-55071-1
Client Project/Site: START R9 - Guam Agent Orange
Revision: 1

For:
Weston Solutions, Inc.
2300 Clayton Road
Suite 900
Concord, California 94520

Attn: Amanda Wagner

Authorized for release by:
11/18/2019 12:08:02 PM

Dylan Bieniulis, Project Manager I
(303)736-0138
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Table of Contents

Definitions/Glossary

Client: Weston Solutions, Inc. Job ID: 320-55071-1
Project/Site: START R9 - Guam Agent Orange

Qualifiers

LCMS

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Dioxin

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits
G	The reported quantitation limit has been raised due to an exhibited elevated noise or matrix interference
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.

General Chemistry

Qualifier	Qualifier Description
F3	Duplicate RPD exceeds the control limit

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Weston Solutions, Inc. Job ID: 320-55071-1
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

CASE NARRATIVE

Client: Weston Solutions, Inc.

Project: START R9 - Guam Agent Orange

Report Number: 320-55071-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

REVISION - 11/18/2019
The client sample ID for laboratory sample 320-55071-4 was revised to match the chain of custody. Original client sample ID was logged incorrectly due to transcription error.

RECEIPT
The samples were received on 10/07/2019; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.8 C.

The chain of custody notes 2 containers were submitted for G-04-01-D (320-55071-4); however, the laboratory only received 1 container. The laboratory split half the volume into a second container to make volume available to both laboratory locations performing the requested analyses (8321A Herbicides in Denver and 8290 Dioxin analysis in Sacramento). The client was notified on 10/8/2019.

HERBICIDES
Samples G-04-02 (320-55071-1), G-04-01 (320-55071-2), G-04-02-D (320-55071-3), G-04-01-D (320-55071-4), G-01-01 (320-55071-5), G-03-01 (320-55071-6), G-03-02 (320-55071-7), G-02-03 (320-55071-8), G-02-02 (320-55071-9) and G-02-01 (320-55071-10) were analyzed for herbicides in accordance with EPA SW-846 Method 8321A. The samples were prepared on 10/10/2019 and analyzed on 11/12/2019.

2,4-DB failed the recovery criteria low for the MS of sample G-01-01 (320-55071-5) in batch 280-477353. 2,4-DB and Dicamba failed the recovery criteria low for the MSD of sample G-01-01 (320-55071-5) in batch 280-477353. Refer to the QC report for details.

The continuing calibration verification (CCV) associated with batch 280-477353 recovered above the upper control limit for 2,4,5-T, 2,4-DB, Dichlorprop and Silvex (2,4,5-TP) The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: G-03-02 (320-55071-7), G-02-03 (320-55071-8), G-02-02 (320-55071-9) and G-02-01 (320-55071-10).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIOXINS AND FURANS (HRGC/HRMS)
Samples G-04-02 (320-55071-1), G-04-01 (320-55071-2), G-04-02-D (320-55071-3), G-04-01-D (320-55071-4), G-01-01 (320-55071-5), G-03-01 (320-55071-6), G-03-02 (320-55071-7), G-02-03 (320-55071-8), G-02-02 (320-55071-9) and G-02-01 (320-55071-10) were analyzed for dioxins and furans (HRGC/HRMS) in accordance with SW846 8290A. The samples were prepared on 10/08/2019 and

Case Narrative

Client: Weston Solutions, Inc. Job ID: 320-55071-1
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1 (Continued)

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

analyzed on 10/17/2019, 10/18/2019 and 10/21/2019.

Several analytes were detected in method blank MB 320-329327/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

1,2,3,4,6,7,8-HpCDD and OCDD failed the recovery criteria high for the MS of sample G-01-01 (320-55071-5) in batch 320-331858. OCDD failed the recovery criteria low for the MSD of sample G-01-01 (320-55071-5) in batch 320-331858. OCDD exceeded the RPD limit. Refer to the QC report for details.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. Refer to the QC report for details.

The following sample exhibited elevated noise or matrix interferences for one or more analytes causing elevation of the detection limit (EDL): G-04-01 (320-55071-2) . The reporting limit (RL) for the affected analytes has been raised to be equal to the EDL, and a "G" qualifier applied.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS

Samples G-04-02 (320-55071-1), G-04-01 (320-55071-2), G-04-02-D (320-55071-3), G-04-01-D (320-55071-4), G-01-01 (320-55071-5), G-03-01 (320-55071-6), G-03-02 (320-55071-7), G-02-03 (320-55071-8), G-02-02 (320-55071-9) and G-02-01 (320-55071-10) were analyzed for percent solids in accordance with ASTM D2216-90. The samples were analyzed on 10/10/2019, 10/11/2019 and 10/14/2019.

Percent Moisture exceeded the RPD limit for the duplicate of sample 320-55123-6. Sample matrix interference and/or non-homogeneity are suspected. The matrix consisted of pebbles. Data is being reported with this narration. Refer to the QC report for details.

No percent moisture was found in the following samples in analytical batch 320-330140 due to hygroscopic characteristics: (480-160240-A-4) and (480-160240-A-4 DU). The matrix of the sample was dry sand. The samples were reweighed and there was no change in weight. Samples were not reanalyzed and is being reported with this narration.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-04-02 — Lab Sample ID: 320-55071-1

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	0.14	J q	1.3	0.062	pg/g	1	☼	8290A	Total/NA
2,3,7,8-TCDF	0.61	J	1.3	0.054	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDD	1.1	J	6.6	0.11	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDF	0.54	J	6.6	0.065	pg/g	1	☼	8290A	Total/NA
2,3,4,7,8-PeCDF	0.51	J q	6.6	0.066	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDD	2.6	J B	6.6	0.16	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDD	6.5	J	6.6	0.14	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDD	6.3	J	6.6	0.14	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDF	1.6	J	6.6	0.15	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDF	0.95	J	6.6	0.14	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDF	0.21	J q B	6.6	0.16	pg/g	1	☼	8290A	Total/NA
2,3,4,6,7,8-HxCDF	1.1	J B	6.6	0.15	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDD	190	B	6.6	2.7	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	29	B	6.6	0.54	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8,9-HpCDF	1.0	J q	6.6	0.66	pg/g	1	☼	8290A	Total/NA
OCDD	1500	B	13	0.84	pg/g	1	☼	8290A	Total/NA
OCDF	45	B	13	0.090	pg/g	1	☼	8290A	Total/NA
Total TCDD	1.1	J q	1.3	0.062	pg/g	1	☼	8290A	Total/NA
Total TCDF	2.8	q	1.3	0.054	pg/g	1	☼	8290A	Total/NA
Total PeCDD	8.0	q	6.6	0.11	pg/g	1	☼	8290A	Total/NA
Total PeCDF	7.6	q	6.6	0.065	pg/g	1	☼	8290A	Total/NA
Total HxCDD	72	B	6.6	0.15	pg/g	1	☼	8290A	Total/NA
Total HxCDF	27	q B	6.6	0.15	pg/g	1	☼	8290A	Total/NA
Total HpCDD	550	B	6.6	2.7	pg/g	1	☼	8290A	Total/NA
Total HpCDF	68	q B	6.6	0.60	pg/g	1	☼	8290A	Total/NA

Client Sample ID: G-04-01 — Lab Sample ID: 320-55071-2

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDF	0.78	J	1.4	0.054	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDD	1.3	J	6.8	0.11	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDF	0.70	J	6.8	0.067	pg/g	1	☼	8290A	Total/NA
2,3,4,7,8-PeCDF	0.66	J	6.8	0.069	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDD	4.2	J B	6.8	0.37	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDD	11		6.8	0.33	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDD	7.0		6.8	0.31	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDF	1.9	J q	6.8	0.20	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDF	1.1	J	6.8	0.19	pg/g	1	☼	8290A	Total/NA
2,3,4,6,7,8-HxCDF	1.2	J B	6.8	0.19	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDD	670	G B	12	12	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	51	B	6.8	1.1	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8,9-HpCDF	1.6	J	6.8	1.3	pg/g	1	☼	8290A	Total/NA
OCDD	4100	B	14	3.1	pg/g	1	☼	8290A	Total/NA
OCDF	170	B	14	0.12	pg/g	1	☼	8290A	Total/NA
Total TCDD	1.1	J q	1.4	0.063	pg/g	1	☼	8290A	Total/NA
Total TCDF	3.2	q	1.4	0.054	pg/g	1	☼	8290A	Total/NA
Total PeCDD	12	q	6.8	0.11	pg/g	1	☼	8290A	Total/NA
Total PeCDF	9.3	q	6.8	0.068	pg/g	1	☼	8290A	Total/NA
Total HxCDD	250	B	6.8	0.34	pg/g	1	☼	8290A	Total/NA
Total HxCDF	44	q B	6.8	0.20	pg/g	1	☼	8290A	Total/NA
Total HpCDD	2900	G B	12	12	pg/g	1	☼	8290A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Detection Summary

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-04-01 (Continued)

Lab Sample ID: 320-55071-2

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
Total HpCDF	180	B	6.8	1.2	pg/g	1	☼	8290A	Total/NA

Client Sample ID: G-04-02-D

Lab Sample ID: 320-55071-3

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	0.23	J q	1.4	0.12	pg/g	1	☼	8290A	Total/NA
2,3,7,8-TCDF	0.77	J	1.4	0.097	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDD	1.3	J	6.8	0.25	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDF	0.58	J	6.8	0.11	pg/g	1	☼	8290A	Total/NA
2,3,4,7,8-PeCDF	0.68	J	6.8	0.11	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDD	3.3	J B	6.8	0.19	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDD	8.1		6.8	0.17	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDD	7.2		6.8	0.16	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDF	2.2	J	6.8	0.20	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDF	1.5	J	6.8	0.19	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDF	0.62	J B	6.8	0.21	pg/g	1	☼	8290A	Total/NA
2,3,4,6,7,8-HxCDF	1.6	J B	6.8	0.19	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDD	230	B	6.8	2.6	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	35	B	6.8	0.53	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8,9-HpCDF	2.0	J	6.8	0.64	pg/g	1	☼	8290A	Total/NA
OCDD	1900	B	14	1.1	pg/g	1	☼	8290A	Total/NA
OCDF	62	B	14	0.18	pg/g	1	☼	8290A	Total/NA
Total TCDD	1.4	q	1.4	0.12	pg/g	1	☼	8290A	Total/NA
Total TCDF	3.5	q	1.4	0.097	pg/g	1	☼	8290A	Total/NA
Total PeCDD	9.4	q	6.8	0.25	pg/g	1	☼	8290A	Total/NA
Total PeCDF	8.3	q	6.8	0.11	pg/g	1	☼	8290A	Total/NA
Total HxCDD	85	B	6.8	0.17	pg/g	1	☼	8290A	Total/NA
Total HxCDF	38	B	6.8	0.20	pg/g	1	☼	8290A	Total/NA
Total HpCDD	680	B	6.8	2.6	pg/g	1	☼	8290A	Total/NA
Total HpCDF	84	B	6.8	0.59	pg/g	1	☼	8290A	Total/NA

Client Sample ID: G-01-01-D

Lab Sample ID: 320-55071-4

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	0.19	J q	1.6	0.053	pg/g	1	☼	8290A	Total/NA
2,3,7,8-TCDF	0.26	J	1.6	0.051	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDD	1.5	J	8.1	0.14	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDF	0.31	J	8.1	0.065	pg/g	1	☼	8290A	Total/NA
2,3,4,7,8-PeCDF	0.33	J	8.1	0.067	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDD	3.5	J B	8.1	0.17	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDD	9.6		8.1	0.15	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDD	8.1		8.1	0.14	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDF	1.2	J	8.1	0.086	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDF	0.70	J	8.1	0.081	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDF	0.27	J B	8.1	0.089	pg/g	1	☼	8290A	Total/NA
2,3,4,6,7,8-HxCDF	0.78	J B	8.1	0.083	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDD	250	B	8.1	2.9	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	18	B	8.1	0.23	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8,9-HpCDF	1.0	J	8.1	0.28	pg/g	1	☼	8290A	Total/NA
OCDD	1900	B	16	1.3	pg/g	1	☼	8290A	Total/NA
OCDF	29	B	16	0.084	pg/g	1	☼	8290A	Total/NA
Total TCDD	0.41	J q	1.6	0.053	pg/g	1	☼	8290A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Detection Summary

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-01-01-D (Continued)

Lab Sample ID: 320-55071-4

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
Total TCDF	0.87	J q	1.6	0.051	pg/g	1	☼	8290A	Total/NA
Total PeCDD	4.3	J q	8.1	0.14	pg/g	1	☼	8290A	Total/NA
Total PeCDF	6.9	J q	8.1	0.066	pg/g	1	☼	8290A	Total/NA
Total HxCDD	55	B	8.1	0.15	pg/g	1	☼	8290A	Total/NA
Total HxCDF	17	q B	8.1	0.085	pg/g	1	☼	8290A	Total/NA
Total HpCDD	450	B	8.1	2.9	pg/g	1	☼	8290A	Total/NA
Total HpCDF	40	B	8.1	0.25	pg/g	1	☼	8290A	Total/NA

Client Sample ID: G-01-01

Lab Sample ID: 320-55071-5

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDF	0.32	J	1.5	0.10	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDD	1.4	J	7.7	0.26	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDF	0.34	J	7.7	0.13	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDD	3.2	J B	7.7	0.25	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDD	7.6	J	7.7	0.22	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDD	7.2	J	7.7	0.21	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDF	0.90	J	7.7	0.16	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDF	0.62	J	7.7	0.15	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDF	0.43	J B	7.7	0.17	pg/g	1	☼	8290A	Total/NA
2,3,4,6,7,8-HxCDF	0.70	J B	7.7	0.16	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDD	210	B F1	7.7	2.6	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	15	B	7.7	0.37	pg/g	1	☼	8290A	Total/NA
OCDD	1700	B F2	15	1.7	pg/g	1	☼	8290A	Total/NA
OCDF	30	B	15	0.17	pg/g	1	☼	8290A	Total/NA
Total TCDF	0.62	J q	1.5	0.10	pg/g	1	☼	8290A	Total/NA
Total PeCDD	3.4	J q	7.7	0.26	pg/g	1	☼	8290A	Total/NA
Total PeCDF	3.6	J q	7.7	0.13	pg/g	1	☼	8290A	Total/NA
Total HxCDD	49	B	7.7	0.23	pg/g	1	☼	8290A	Total/NA
Total HxCDF	16	q B	7.7	0.16	pg/g	1	☼	8290A	Total/NA
Total HpCDD	390	B	7.7	2.6	pg/g	1	☼	8290A	Total/NA
Total HpCDF	39	B	7.7	0.41	pg/g	1	☼	8290A	Total/NA

Client Sample ID: G-03-01

Lab Sample ID: 320-55071-6

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	1.3		1.3	0.051	pg/g	1	☼	8290A	Total/NA
2,3,7,8-TCDF	0.69	J	1.3	0.047	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDD	0.63	J	6.6	0.052	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDF	0.16	J q	6.6	0.051	pg/g	1	☼	8290A	Total/NA
2,3,4,7,8-PeCDF	0.19	J	6.6	0.052	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDD	1.6	J B	6.6	0.091	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDD	3.1	J	6.6	0.080	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDD	3.5	J	6.6	0.077	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDF	0.52	J	6.6	0.062	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDF	0.35	J	6.6	0.058	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDF	0.21	J B	6.6	0.064	pg/g	1	☼	8290A	Total/NA
2,3,4,6,7,8-HxCDF	0.37	J B	6.6	0.060	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDD	140	B	6.6	1.5	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	13	B	6.6	0.16	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8,9-HpCDF	0.63	J	6.6	0.20	pg/g	1	☼	8290A	Total/NA
OCDD	1000	B	13	0.74	pg/g	1	☼	8290A	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-03-01 (Continued) — Lab Sample ID: 320-55071-6

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
OCDF	33	B	13	0.058	pg/g	1	☼	8290A	Total/NA
Total TCDD	2.1	q	1.3	0.051	pg/g	1	☼	8290A	Total/NA
Total TCDF	3.3	q	1.3	0.047	pg/g	1	☼	8290A	Total/NA
Total PeCDD	1.5	J q	6.6	0.052	pg/g	1	☼	8290A	Total/NA
Total PeCDF	4.8	J q	6.6	0.051	pg/g	1	☼	8290A	Total/NA
Total HxCDD	30	q B	6.6	0.083	pg/g	1	☼	8290A	Total/NA
Total HxCDF	7.5	B	6.6	0.061	pg/g	1	☼	8290A	Total/NA
Total HpCDD	290	B	6.6	1.5	pg/g	1	☼	8290A	Total/NA
Total HpCDF	30	B	6.6	0.18	pg/g	1	☼	8290A	Total/NA

Client Sample ID: G-03-02 — Lab Sample ID: 320-55071-7

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	1.6	q	1.3	0.051	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDD	0.78	J	6.3	0.093	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDF	0.30	J	6.3	0.087	pg/g	1	☼	8290A	Total/NA
2,3,4,7,8-PeCDF	0.28	J	6.3	0.090	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDD	1.6	J B	6.3	0.11	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDD	4.4	J	6.3	0.093	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDD	4.0	J	6.3	0.090	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDF	0.68	J	6.3	0.084	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDF	0.49	J	6.3	0.079	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDF	0.21	J q B	6.3	0.087	pg/g	1	☼	8290A	Total/NA
2,3,4,6,7,8-HxCDF	0.59	J B	6.3	0.081	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDD	150	B	6.3	1.9	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	19	B	6.3	0.23	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8,9-HpCDF	0.57	J	6.3	0.28	pg/g	1	☼	8290A	Total/NA
OCDD	1200	B	13	0.87	pg/g	1	☼	8290A	Total/NA
OCDF	32	B	13	0.055	pg/g	1	☼	8290A	Total/NA
Total TCDD	2.0	q	1.3	0.051	pg/g	1	☼	8290A	Total/NA
Total TCDF	5.2		1.3	0.050	pg/g	1	☼	8290A	Total/NA
Total PeCDD	1.7	J q	6.3	0.093	pg/g	1	☼	8290A	Total/NA
Total PeCDF	8.4		6.3	0.088	pg/g	1	☼	8290A	Total/NA
Total HxCDD	33	B	6.3	0.097	pg/g	1	☼	8290A	Total/NA
Total HxCDF	12	q B	6.3	0.083	pg/g	1	☼	8290A	Total/NA
Total HpCDD	290	B	6.3	1.9	pg/g	1	☼	8290A	Total/NA
Total HpCDF	39	B	6.3	0.26	pg/g	1	☼	8290A	Total/NA
2,3,7,8-TCDF - RA	0.75	J	1.3	0.48	pg/g	1	☼	8290A	Total/NA

Client Sample ID: G-02-03 — Lab Sample ID: 320-55071-8

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	0.60	J	1.6	0.055	pg/g	1	☼	8290A	Total/NA
2,3,7,8-TCDF	0.28	J	1.6	0.039	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDD	1.3	J	8.2	0.13	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDF	0.42	J	8.2	0.091	pg/g	1	☼	8290A	Total/NA
2,3,4,7,8-PeCDF	0.61	J	8.2	0.094	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDD	3.3	J B	8.2	0.14	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDD	5.4	J	8.2	0.12	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDD	5.9	J	8.2	0.11	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDF	2.1	J	8.2	0.16	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDF	1.9	J	8.2	0.15	pg/g	1	☼	8290A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Detection Summary

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-02-03 (Continued) — Lab Sample ID: 320-55071-8

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
1,2,3,7,8,9-HxCDF	0.91	J B	8.2	0.17	pg/g	1	☼	8290A	Total/NA
2,3,4,6,7,8-HxCDF	2.2	J B	8.2	0.16	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDD	200	B	8.2	3.3	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	58	B	8.2	0.66	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8,9-HpCDF	3.1	J	8.2	0.80	pg/g	1	☼	8290A	Total/NA
OCDD	1700	B	16	1.1	pg/g	1	☼	8290A	Total/NA
OCDF	130	B	16	0.12	pg/g	1	☼	8290A	Total/NA
Total TCDD	1.4	J q	1.6	0.055	pg/g	1	☼	8290A	Total/NA
Total TCDF	1.6	q	1.6	0.039	pg/g	1	☼	8290A	Total/NA
Total PeCDD	5.6	J q	8.2	0.13	pg/g	1	☼	8290A	Total/NA
Total PeCDF	6.1	J q	8.2	0.092	pg/g	1	☼	8290A	Total/NA
Total HxCDD	62	B	8.2	0.12	pg/g	1	☼	8290A	Total/NA
Total HxCDF	37	B	8.2	0.16	pg/g	1	☼	8290A	Total/NA
Total HpCDD	640	B	8.2	3.3	pg/g	1	☼	8290A	Total/NA
Total HpCDF	130	B	8.2	0.73	pg/g	1	☼	8290A	Total/NA

Client Sample ID: G-02-02 — Lab Sample ID: 320-55071-9

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	0.17	J q	1.3	0.041	pg/g	1	☼	8290A	Total/NA
2,3,7,8-TCDF	0.50	J	1.3	0.033	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDD	0.63	J	6.4	0.097	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDF	0.35	J	6.4	0.042	pg/g	1	☼	8290A	Total/NA
2,3,4,7,8-PeCDF	0.59	J	6.4	0.043	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDD	1.6	J B	6.4	0.096	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDD	2.6	J	6.4	0.084	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDD	3.0	J	6.4	0.081	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDF	1.1	J	6.4	0.056	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDF	0.79	J	6.4	0.052	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDF	1.1	J B	6.4	0.058	pg/g	1	☼	8290A	Total/NA
2,3,4,6,7,8-HxCDF	0.84	J B	6.4	0.054	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDD	49	B	6.4	0.55	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	5.2	J B	6.4	0.13	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8,9-HpCDF	2.1	J q	6.4	0.15	pg/g	1	☼	8290A	Total/NA
OCDD	280	B	13	0.22	pg/g	1	☼	8290A	Total/NA
OCDF	16	B	13	0.066	pg/g	1	☼	8290A	Total/NA
Total TCDD	0.71	J q	1.3	0.041	pg/g	1	☼	8290A	Total/NA
Total TCDF	1.8	q	1.3	0.033	pg/g	1	☼	8290A	Total/NA
Total PeCDD	3.4	J q	6.4	0.097	pg/g	1	☼	8290A	Total/NA
Total PeCDF	2.4	J q	6.4	0.043	pg/g	1	☼	8290A	Total/NA
Total HxCDD	21	q B	6.4	0.087	pg/g	1	☼	8290A	Total/NA
Total HxCDF	6.8	B	6.4	0.055	pg/g	1	☼	8290A	Total/NA
Total HpCDD	98	B	6.4	0.55	pg/g	1	☼	8290A	Total/NA
Total HpCDF	13	q B	6.4	0.14	pg/g	1	☼	8290A	Total/NA

Client Sample ID: G-02-01 — Lab Sample ID: 320-55071-10

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,7,8-TCDD	0.17	J q	1.4	0.042	pg/g	1	☼	8290A	Total/NA
2,3,7,8-TCDF	0.35	J	1.4	0.038	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDD	0.42	J	6.9	0.073	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8-PeCDF	0.19	J	6.9	0.049	pg/g	1	☼	8290A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Detection Summary

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-02-01 (Continued)

Lab Sample ID: 320-55071-10

Analyte	Result	Qualifier	RL	EDL	Unit	Dil Fac	D	Method	Prep Type
2,3,4,7,8-PeCDF	0.27	J	6.9	0.051	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDD	1.3	J B	6.9	0.14	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDD	5.7	J	6.9	0.12	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDD	2.5	J	6.9	0.12	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8-HxCDF	0.86	J	6.9	0.14	pg/g	1	☼	8290A	Total/NA
1,2,3,6,7,8-HxCDF	0.43	J	6.9	0.13	pg/g	1	☼	8290A	Total/NA
1,2,3,7,8,9-HxCDF	0.29	J q B	6.9	0.14	pg/g	1	☼	8290A	Total/NA
2,3,4,6,7,8-HxCDF	0.64	J B	6.9	0.13	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDD	170	B	6.9	2.0	pg/g	1	☼	8290A	Total/NA
1,2,3,4,6,7,8-HpCDF	22	B	6.9	0.32	pg/g	1	☼	8290A	Total/NA
1,2,3,4,7,8,9-HpCDF	1.1	J	6.9	0.39	pg/g	1	☼	8290A	Total/NA
OCDD	1500	B	14	1.1	pg/g	1	☼	8290A	Total/NA
OCDF	59	B	14	0.080	pg/g	1	☼	8290A	Total/NA
Total TCDD	0.59	J q	1.4	0.042	pg/g	1	☼	8290A	Total/NA
Total TCDF	0.98	J q	1.4	0.038	pg/g	1	☼	8290A	Total/NA
Total PeCDD	2.2	J q	6.9	0.073	pg/g	1	☼	8290A	Total/NA
Total PeCDF	2.8	J q	6.9	0.050	pg/g	1	☼	8290A	Total/NA
Total HxCDD	32	B	6.9	0.13	pg/g	1	☼	8290A	Total/NA
Total HxCDF	18	q B	6.9	0.13	pg/g	1	☼	8290A	Total/NA
Total HpCDD	320	B	6.9	2.0	pg/g	1	☼	8290A	Total/NA
Total HpCDF	62	B	6.9	0.35	pg/g	1	☼	8290A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-04-02

Date Collected: 10/04/19 11:20
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-1

Matrix: Solid
Percent Solids: 76.8

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		0.0060	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
2,4-D	ND		0.0060	0.00073	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
2,4-DB	ND		0.014	0.0064	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
Dicamba	ND		0.0072	0.0034	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
Dichlorprop	ND		0.0060	0.00076	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
MCPA	ND		0.0060	0.00070	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
MCPP	ND		0.0060	0.00056	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1
Silvex (2,4,5-TP)	ND		0.0060	0.00089	mg/Kg	☼	10/10/19 16:33	11/12/19 04:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*30*		*22 - 111*	*10/10/19 16:33*	*11/12/19 04:41*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	**0.14**	**J q**	1.3	0.062	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
2,3,7,8-TCDF	**0.61**	**J**	1.3	0.054	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,7,8-PeCDD	**1.1**	**J**	6.6	0.11	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,7,8-PeCDF	**0.54**	**J**	6.6	0.065	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
2,3,4,7,8-PeCDF	**0.51**	**J q**	6.6	0.066	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,4,7,8-HxCDD	**2.6**	**J B**	6.6	0.16	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,6,7,8-HxCDD	**6.5**	**J**	6.6	0.14	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,7,8,9-HxCDD	**6.3**	**J**	6.6	0.14	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,4,7,8-HxCDF	**1.6**	**J**	6.6	0.15	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,6,7,8-HxCDF	**0.95**	**J**	6.6	0.14	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,7,8,9-HxCDF	**0.21**	**J q B**	6.6	0.16	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
2,3,4,6,7,8-HxCDF	**1.1**	**J B**	6.6	0.15	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,4,6,7,8-HpCDD	**190**	**B**	6.6	2.7	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,4,6,7,8-HpCDF	**29**	**B**	6.6	0.54	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
1,2,3,4,7,8,9-HpCDF	**1.0**	**J q**	6.6	0.66	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
OCDD	**1500**	**B**	13	0.84	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
OCDF	**45**	**B**	13	0.090	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total TCDD	**1.1**	**J q**	1.3	0.062	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total TCDF	**2.8**	**q**	1.3	0.054	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total PeCDD	**8.0**	**q**	6.6	0.11	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total PeCDF	**7.6**	**q**	6.6	0.065	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total HxCDD	**72**	**B**	6.6	0.15	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total HxCDF	**27**	**q B**	6.6	0.15	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total HpCDD	**550**	**B**	6.6	2.7	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1
Total HpCDF	**68**	**q B**	6.6	0.60	pg/g	☼	10/08/19 14:09	10/17/19 22:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*71*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-2,3,7,8-TCDF	*63*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-1,2,3,7,8-PeCDD	*70*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-1,2,3,7,8-PeCDF	*69*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-1,2,3,6,7,8-HxCDD	*58*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-1,2,3,4,7,8-HxCDF	*63*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*64*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*60*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*
13C-OCDD	*62*		*40 - 135*	*10/08/19 14:09*	*10/17/19 22:55*	*1*

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-04-02

Date Collected: 10/04/19 11:20
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-1

Matrix: Solid
Percent Solids: 76.8

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	23.2		0.1	0.1	%			10/14/19 16:37	1
Percent Solids	76.8		0.1	0.1	%			10/14/19 16:37	1

Client Sample ID: G-04-01

Date Collected: 10/04/19 11:18
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-2

Matrix: Solid
Percent Solids: 74.7

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		0.0064	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
2,4-D	ND		0.0064	0.00078	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
2,4-DB	ND		0.015	0.0068	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
Dicamba	ND		0.0077	0.0037	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
Dichlorprop	ND		0.0064	0.00081	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
MCPA	ND		0.0064	0.00074	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
MCPP	ND		0.0064	0.00060	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1
Silvex (2,4,5-TP)	ND		0.0064	0.00095	mg/Kg	☼	10/10/19 16:33	11/12/19 04:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*47*		*22 - 111*	*10/10/19 16:33*	*11/12/19 04:47*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		1.4	0.063	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
2,3,7,8-TCDF	0.78	J	1.4	0.054	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,7,8-PeCDD	1.3	J	6.8	0.11	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,7,8-PeCDF	0.70	J	6.8	0.067	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
2,3,4,7,8-PeCDF	0.66	J	6.8	0.069	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,4,7,8-HxCDD	4.2	J B	6.8	0.37	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,6,7,8-HxCDD	11		6.8	0.33	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,7,8,9-HxCDD	7.0		6.8	0.31	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,4,7,8-HxCDF	1.9	J q	6.8	0.20	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,6,7,8-HxCDF	1.1	J	6.8	0.19	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,7,8,9-HxCDF	ND		6.8	0.21	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
2,3,4,6,7,8-HxCDF	1.2	J B	6.8	0.19	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,4,6,7,8-HpCDD	670	G B	12	12	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,4,6,7,8-HpCDF	51	B	6.8	1.1	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
1,2,3,4,7,8,9-HpCDF	1.6	J	6.8	1.3	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
OCDD	4100	B	14	3.1	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
OCDF	170	B	14	0.12	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total TCDD	1.1	J q	1.4	0.063	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total TCDF	3.2	q	1.4	0.054	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total PeCDD	12	q	6.8	0.11	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total PeCDF	9.3	q	6.8	0.068	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total HxCDD	250	B	6.8	0.34	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total HxCDF	44	q B	6.8	0.20	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total HpCDD	2900	G B	12	12	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1
Total HpCDF	180	B	6.8	1.2	pg/g	☼	10/08/19 14:09	10/17/19 23:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*68*		*40 - 135*	*10/08/19 14:09*	*10/17/19 23:41*	*1*

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-04-01

Lab Sample ID: 320-55071-2
Date Collected: 10/04/19 11:18
Matrix: Solid
Date Received: 10/07/19 09:05
Percent Solids: 74.7

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*60*		*40 - 135*	*10/08/19 14:09*	*10/17/19 23:41*	*1*
13C-1,2,3,7,8-PeCDD	*74*		*40 - 135*	*10/08/19 14:09*	*10/17/19 23:41*	*1*
13C-1,2,3,7,8-PeCDF	*68*		*40 - 135*	*10/08/19 14:09*	*10/17/19 23:41*	*1*
13C-1,2,3,6,7,8-HxCDD	*64*		*40 - 135*	*10/08/19 14:09*	*10/17/19 23:41*	*1*
13C-1,2,3,4,7,8-HxCDF	*64*		*40 - 135*	*10/08/19 14:09*	*10/17/19 23:41*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*71*		*40 - 135*	*10/08/19 14:09*	*10/17/19 23:41*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*64*		*40 - 135*	*10/08/19 14:09*	*10/17/19 23:41*	*1*
13C-OCDD	*67*		*40 - 135*	*10/08/19 14:09*	*10/17/19 23:41*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**25.3**		0.1	0.1	%			10/14/19 16:37	1
Percent Solids	**74.7**		0.1	0.1	%			10/14/19 16:37	1

Client Sample ID: G-04-02-D

Lab Sample ID: 320-55071-3
Date Collected: 10/04/19 11:35
Matrix: Solid
Date Received: 10/07/19 09:05
Percent Solids: 74.4

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		0.0063	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
2,4-D	ND		0.0063	0.00077	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
2,4-DB	ND		0.015	0.0067	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
Dicamba	ND		0.0076	0.0036	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
Dichlorprop	ND		0.0063	0.00080	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
MCPA	ND		0.0063	0.00073	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
MCPP	ND		0.0063	0.00059	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1
Silvex (2,4,5-TP)	ND		0.0063	0.00094	mg/Kg	☼	10/10/19 16:33	11/12/19 04:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*33*		*22 - 111*	*10/10/19 16:33*	*11/12/19 04:53*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	**0.23**	**J q**	1.4	0.12	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
2,3,7,8-TCDF	**0.77**	**J**	1.4	0.097	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,7,8-PeCDD	**1.3**	**J**	6.8	0.25	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,7,8-PeCDF	**0.58**	**J**	6.8	0.11	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
2,3,4,7,8-PeCDF	**0.68**	**J**	6.8	0.11	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,4,7,8-HxCDD	**3.3**	**J B**	6.8	0.19	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,6,7,8-HxCDD	**8.1**		6.8	0.17	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,7,8,9-HxCDD	**7.2**		6.8	0.16	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,4,7,8-HxCDF	**2.2**	**J**	6.8	0.20	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,6,7,8-HxCDF	**1.5**	**J**	6.8	0.19	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,7,8,9-HxCDF	**0.62**	**J B**	6.8	0.21	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
2,3,4,6,7,8-HxCDF	**1.6**	**J B**	6.8	0.19	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,4,6,7,8-HpCDD	**230**	**B**	6.8	2.6	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,4,6,7,8-HpCDF	**35**	**B**	6.8	0.53	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
1,2,3,4,7,8,9-HpCDF	**2.0**	**J**	6.8	0.64	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
OCDD	**1900**	**B**	14	1.1	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
OCDF	**62**	**B**	14	0.18	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-04-02-D

Date Collected: 10/04/19 11:35
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-3

Matrix: Solid
Percent Solids: 74.4

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
Total TCDD	1.4	q	1.4	0.12	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total TCDF	3.5	q	1.4	0.097	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total PeCDD	9.4	q	6.8	0.25	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total PeCDF	8.3	q	6.8	0.11	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total HxCDD	85	B	6.8	0.17	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total HxCDF	38	B	6.8	0.20	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total HpCDD	680	B	6.8	2.6	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1
Total HpCDF	84	B	6.8	0.59	pg/g	☼	10/08/19 14:09	10/21/19 22:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*68*		*40 - 135*	*10/08/19 14:09*	*10/21/19 22:24*	*1*
13C-2,3,7,8-TCDF	*62*		*40 - 135*	*10/08/19 14:09*	*10/21/19 22:24*	*1*
13C-1,2,3,7,8-PeCDD	*66*		*40 - 135*	*10/08/19 14:09*	*10/21/19 22:24*	*1*
13C-1,2,3,7,8-PeCDF	*71*		*40 - 135*	*10/08/19 14:09*	*10/21/19 22:24*	*1*
13C-1,2,3,6,7,8-HxCDD	*65*		*40 - 135*	*10/08/19 14:09*	*10/21/19 22:24*	*1*
13C-1,2,3,4,7,8-HxCDF	*72*		*40 - 135*	*10/08/19 14:09*	*10/21/19 22:24*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*53*		*40 - 135*	*10/08/19 14:09*	*10/21/19 22:24*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*54*		*40 - 135*	*10/08/19 14:09*	*10/21/19 22:24*	*1*
13C-OCDD	*46*		*40 - 135*	*10/08/19 14:09*	*10/21/19 22:24*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	25.6		0.1	0.1	%			10/14/19 16:37	1
Percent Solids	74.4		0.1	0.1	%			10/14/19 16:37	1

Client Sample ID: G-01-01-D

Date Collected: 10/02/19 10:50
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-4

Matrix: Solid
Percent Solids: 62.0

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		0.0077	0.0014	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
2,4-D	ND		0.0077	0.00093	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
2,4-DB	ND		0.018	0.0081	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
Dicamba	ND		0.0092	0.0044	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
Dichlorprop	ND		0.0077	0.00096	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
MCPA	ND		0.0077	0.00089	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
MCPP	ND		0.0077	0.00072	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1
Silvex (2,4,5-TP)	ND		0.0077	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 04:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*42*		*22 - 111*	*10/10/19 16:33*	*11/12/19 04:59*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.19	J q	1.6	0.053	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
2,3,7,8-TCDF	0.26	J	1.6	0.051	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,7,8-PeCDD	1.5	J	8.1	0.14	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,7,8-PeCDF	0.31	J	8.1	0.065	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
2,3,4,7,8-PeCDF	0.33	J	8.1	0.067	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,4,7,8-HxCDD	3.5	J B	8.1	0.17	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1

Client Sample Results

Client: Weston Solutions, Inc. Job ID: 320-55071-1
Project/Site: START R9 - Guam Agent Orange

Client Sample ID: G-01-01-D — Lab Sample ID: 320-55071-4

Date Collected: 10/02/19 10:50 Matrix: Solid
Date Received: 10/07/19 09:05 Percent Solids: 62.0

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,6,7,8-HxCDD	9.6		8.1	0.15	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,7,8,9-HxCDD	8.1		8.1	0.14	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,4,7,8-HxCDF	1.2	J	8.1	0.086	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,6,7,8-HxCDF	0.70	J	8.1	0.081	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,7,8,9-HxCDF	0.27	J B	8.1	0.089	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
2,3,4,6,7,8-HxCDF	0.78	J B	8.1	0.083	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,4,6,7,8-HpCDD	250	B	8.1	2.9	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,4,6,7,8-HpCDF	18	B	8.1	0.23	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
1,2,3,4,7,8,9-HpCDF	1.0	J	8.1	0.28	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
OCDD	1900	B	16	1.3	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
OCDF	29	B	16	0.084	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total TCDD	0.41	J q	1.6	0.053	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total TCDF	0.87	J q	1.6	0.051	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total PeCDD	4.3	J q	8.1	0.14	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total PeCDF	6.9	J q	8.1	0.066	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total HxCDD	55	B	8.1	0.15	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total HxCDF	17	q B	8.1	0.085	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total HpCDD	450	B	8.1	2.9	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1
Total HpCDF	40	B	8.1	0.25	pg/g	☼	10/08/19 14:09	10/18/19 04:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*68*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-2,3,7,8-TCDF	*60*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-1,2,3,7,8-PeCDD	*71*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-1,2,3,7,8-PeCDF	*65*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-1,2,3,6,7,8-HxCDD	*61*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-1,2,3,4,7,8-HxCDF	*65*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*68*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*63*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*
13C-OCDD	*66*		*40 - 135*	*10/08/19 14:09*	*10/18/19 04:49*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	38.0		0.1	0.1	%			10/10/19 17:32	1
Percent Solids	62.0		0.1	0.1	%			10/10/19 17:32	1

Client Sample ID: G-01-01 — Lab Sample ID: 320-55071-5

Date Collected: 10/02/19 10:05 Matrix: Solid
Date Received: 10/07/19 09:05 Percent Solids: 65.5

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		0.0076	0.0013	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
2,4-D	ND		0.0076	0.00092	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
2,4-DB	ND	F1	0.018	0.0080	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
Dicamba	ND	F1	0.0091	0.0043	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
Dichlorprop	ND		0.0076	0.00095	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
MCPA	ND		0.0076	0.00088	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
MCPP	ND		0.0076	0.00071	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1
Silvex (2,4,5-TP)	ND		0.0076	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 05:05	1

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-01-01

Date Collected: 10/02/19 10:05
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-5

Matrix: Solid
Percent Solids: 65.5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	33		22 - 111	10/10/19 16:33	11/12/19 05:05	1

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		1.5	0.13	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
2,3,7,8-TCDF	**0.32**	**J**	1.5	0.10	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,7,8-PeCDD	**1.4**	**J**	7.7	0.26	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,7,8-PeCDF	**0.34**	**J**	7.7	0.13	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
2,3,4,7,8-PeCDF	ND		7.7	0.13	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,4,7,8-HxCDD	**3.2**	**J B**	7.7	0.25	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,6,7,8-HxCDD	**7.6**	**J**	7.7	0.22	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,7,8,9-HxCDD	**7.2**	**J**	7.7	0.21	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,4,7,8-HxCDF	**0.90**	**J**	7.7	0.16	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,6,7,8-HxCDF	**0.62**	**J**	7.7	0.15	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,7,8,9-HxCDF	**0.43**	**J B**	7.7	0.17	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
2,3,4,6,7,8-HxCDF	**0.70**	**J B**	7.7	0.16	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,4,6,7,8-HpCDD	**210**	**B F1**	7.7	2.6	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,4,6,7,8-HpCDF	**15**	**B**	7.7	0.37	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
1,2,3,4,7,8,9-HpCDF	ND		7.7	0.45	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
OCDD	**1700**	**B F2**	15	1.7	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
OCDF	**30**	**B**	15	0.17	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total TCDD	ND		1.5	0.13	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total TCDF	**0.62**	**J q**	1.5	0.10	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total PeCDD	**3.4**	**J q**	7.7	0.26	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total PeCDF	**3.6**	**J q**	7.7	0.13	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total HxCDD	**49**	**B**	7.7	0.23	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total HxCDF	**16**	**q B**	7.7	0.16	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total HpCDD	**390**	**B**	7.7	2.6	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1
Total HpCDF	**39**	**B**	7.7	0.41	pg/g	☼	10/08/19 14:09	10/18/19 05:35	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDD	71		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-2,3,7,8-TCDF	64		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-1,2,3,7,8-PeCDD	73		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-1,2,3,7,8-PeCDF	68		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-1,2,3,6,7,8-HxCDD	61		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-1,2,3,4,7,8-HxCDF	61		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-1,2,3,4,6,7,8-HpCDD	68		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-1,2,3,4,6,7,8-HpCDF	59		40 - 135	10/08/19 14:09	10/18/19 05:35	1
13C-OCDD	60		40 - 135	10/08/19 14:09	10/18/19 05:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**34.5**		0.1	0.1	%			10/11/19 16:06	1
Percent Solids	**65.5**		0.1	0.1	%			10/11/19 16:06	1

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-03-01

Date Collected: 10/02/19 14:55
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-6

Matrix: Solid
Percent Solids: 75.6

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		0.0060	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
2,4-D	ND		0.0060	0.00073	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
2,4-DB	ND		0.014	0.0064	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
Dicamba	ND		0.0072	0.0034	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
Dichlorprop	ND		0.0060	0.00076	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
MCPA	ND		0.0060	0.00070	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
MCPP	ND		0.0060	0.00057	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1
Silvex (2,4,5-TP)	ND		0.0060	0.00089	mg/Kg	☼	10/10/19 16:33	11/12/19 05:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*32*		*22 - 111*	*10/10/19 16:33*	*11/12/19 05:23*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	**1.3**		1.3	0.051	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
2,3,7,8-TCDF	**0.69**	**J**	1.3	0.047	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,7,8-PeCDD	**0.63**	**J**	6.6	0.052	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,7,8-PeCDF	**0.16**	**J q**	6.6	0.051	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
2,3,4,7,8-PeCDF	**0.19**	**J**	6.6	0.052	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,4,7,8-HxCDD	**1.6**	**J B**	6.6	0.091	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,6,7,8-HxCDD	**3.1**	**J**	6.6	0.080	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,7,8,9-HxCDD	**3.5**	**J**	6.6	0.077	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,4,7,8-HxCDF	**0.52**	**J**	6.6	0.062	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,6,7,8-HxCDF	**0.35**	**J**	6.6	0.058	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,7,8,9-HxCDF	**0.21**	**J B**	6.6	0.064	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
2,3,4,6,7,8-HxCDF	**0.37**	**J B**	6.6	0.060	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,4,6,7,8-HpCDD	**140**	**B**	6.6	1.5	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,4,6,7,8-HpCDF	**13**	**B**	6.6	0.16	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
1,2,3,4,7,8,9-HpCDF	**0.63**	**J**	6.6	0.20	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
OCDD	**1000**	**B**	13	0.74	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
OCDF	**33**	**B**	13	0.058	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total TCDD	**2.1**	**q**	1.3	0.051	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total TCDF	**3.3**	**q**	1.3	0.047	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total PeCDD	**1.5**	**J q**	6.6	0.052	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total PeCDF	**4.8**	**J q**	6.6	0.051	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total HxCDD	**30**	**q B**	6.6	0.083	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total HxCDF	**7.5**	**B**	6.6	0.061	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total HpCDD	**290**	**B**	6.6	1.5	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1
Total HpCDF	**30**	**B**	6.6	0.18	pg/g	☼	10/08/19 14:09	10/18/19 07:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*69*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-2,3,7,8-TCDF	*59*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-1,2,3,7,8-PeCDD	*76*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-1,2,3,7,8-PeCDF	*68*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-1,2,3,6,7,8-HxCDD	*63*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-1,2,3,4,7,8-HxCDF	*65*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*73*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*67*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*
13C-OCDD	*67*		*40 - 135*	*10/08/19 14:09*	*10/18/19 07:53*	*1*

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-03-01

Lab Sample ID: 320-55071-6
Date Collected: 10/02/19 14:55
Matrix: Solid
Date Received: 10/07/19 09:05
Percent Solids: 75.6

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	24.4		0.1	0.1	%			10/11/19 16:06	1
Percent Solids	75.6		0.1	0.1	%			10/11/19 16:06	1

Client Sample ID: G-03-02

Lab Sample ID: 320-55071-7
Date Collected: 10/02/19 15:10
Matrix: Solid
Date Received: 10/07/19 09:05
Percent Solids: 79.0

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		0.0061	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
2,4-D	ND		0.0061	0.00075	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
2,4-DB	ND		0.015	0.0065	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
Dicamba	ND		0.0074	0.0035	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
Dichlorprop	ND		0.0061	0.00077	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
MCPA	ND		0.0061	0.00071	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
MCPP	ND		0.0061	0.00058	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1
Silvex (2,4,5-TP)	ND		0.0061	0.00091	mg/Kg	☼	10/10/19 16:33	11/12/19 05:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*35*		*22 - 111*	*10/10/19 16:33*	*11/12/19 05:36*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	1.6	q	1.3	0.051	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,7,8-PeCDD	0.78	J	6.3	0.093	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,7,8-PeCDF	0.30	J	6.3	0.087	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
2,3,4,7,8-PeCDF	0.28	J	6.3	0.090	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,4,7,8-HxCDD	1.6	J B	6.3	0.11	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,6,7,8-HxCDD	4.4	J	6.3	0.093	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,7,8,9-HxCDD	4.0	J	6.3	0.090	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,4,7,8-HxCDF	0.68	J	6.3	0.084	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,6,7,8-HxCDF	0.49	J	6.3	0.079	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,7,8,9-HxCDF	0.21	J q B	6.3	0.087	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
2,3,4,6,7,8-HxCDF	0.59	J B	6.3	0.081	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,4,6,7,8-HpCDD	150	B	6.3	1.9	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,4,6,7,8-HpCDF	19	B	6.3	0.23	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
1,2,3,4,7,8,9-HpCDF	0.57	J	6.3	0.28	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
OCDD	1200	B	13	0.87	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
OCDF	32	B	13	0.055	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total TCDD	2.0	q	1.3	0.051	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total TCDF	5.2		1.3	0.050	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total PeCDD	1.7	J q	6.3	0.093	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total PeCDF	8.4		6.3	0.088	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total HxCDD	33	B	6.3	0.097	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total HxCDF	12	q B	6.3	0.083	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total HpCDD	290	B	6.3	1.9	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1
Total HpCDF	39	B	6.3	0.26	pg/g	☼	10/08/19 14:09	10/18/19 08:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*66*		*40 - 135*	*10/08/19 14:09*	*10/18/19 08:39*	*1*
13C-2,3,7,8-TCDF	*58*		*40 - 135*	*10/08/19 14:09*	*10/18/19 08:39*	*1*

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-03-02

Lab Sample ID: 320-55071-7
Date Collected: 10/02/19 15:10
Matrix: Solid
Date Received: 10/07/19 09:05
Percent Solids: 79.0

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,7,8-PeCDD	*72*		*40 - 135*	*10/08/19 14:09*	*10/18/19 08:39*	*1*
13C-1,2,3,7,8-PeCDF	*64*		*40 - 135*	*10/08/19 14:09*	*10/18/19 08:39*	*1*
13C-1,2,3,6,7,8-HxCDD	*61*		*40 - 135*	*10/08/19 14:09*	*10/18/19 08:39*	*1*
13C-1,2,3,4,7,8-HxCDF	*64*		*40 - 135*	*10/08/19 14:09*	*10/18/19 08:39*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*69*		*40 - 135*	*10/08/19 14:09*	*10/18/19 08:39*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*65*		*40 - 135*	*10/08/19 14:09*	*10/18/19 08:39*	*1*
13C-OCDD	*64*		*40 - 135*	*10/08/19 14:09*	*10/18/19 08:39*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS) - RA

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	**0.75**	**J**	1.3	0.48	pg/g	☼	10/08/19 14:09	10/18/19 18:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*67*		*40 - 135*	*10/08/19 14:09*	*10/18/19 18:49*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**21.0**		0.1	0.1	%			10/10/19 17:32	1
Percent Solids	**79.0**		0.1	0.1	%			10/10/19 17:32	1

Client Sample ID: G-02-03

Lab Sample ID: 320-55071-8
Date Collected: 10/02/19 11:29
Matrix: Solid
Date Received: 10/07/19 09:05
Percent Solids: 62.0

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		0.0078	0.0014	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
2,4-D	ND		0.0078	0.00096	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
2,4-DB	ND		0.019	0.0083	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
Dicamba	ND		0.0094	0.0045	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
Dichlorprop	ND		0.0078	0.00099	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
MCPA	ND		0.0078	0.00091	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
MCPP	ND		0.0078	0.00074	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1
Silvex (2,4,5-TP)	ND		0.0078	0.0012	mg/Kg	☼	10/10/19 16:33	11/12/19 05:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*37*		*22 - 111*	*10/10/19 16:33*	*11/12/19 05:42*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	**0.60**	**J**	1.6	0.055	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
2,3,7,8-TCDF	**0.28**	**J**	1.6	0.039	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,7,8-PeCDD	**1.3**	**J**	8.2	0.13	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,7,8-PeCDF	**0.42**	**J**	8.2	0.091	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
2,3,4,7,8-PeCDF	**0.61**	**J**	8.2	0.094	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,4,7,8-HxCDD	**3.3**	**J B**	8.2	0.14	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,6,7,8-HxCDD	**5.4**	**J**	8.2	0.12	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,7,8,9-HxCDD	**5.9**	**J**	8.2	0.11	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,4,7,8-HxCDF	**2.1**	**J**	8.2	0.16	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,6,7,8-HxCDF	**1.9**	**J**	8.2	0.15	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,7,8,9-HxCDF	**0.91**	**J B**	8.2	0.17	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
2,3,4,6,7,8-HxCDF	**2.2**	**J B**	8.2	0.16	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-02-03

Lab Sample ID: 320-55071-8
Date Collected: 10/02/19 11:29
Matrix: Solid
Date Received: 10/07/19 09:05
Percent Solids: 62.0

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	200	B	8.2	3.3	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,4,6,7,8-HpCDF	58	B	8.2	0.66	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
1,2,3,4,7,8,9-HpCDF	3.1	J	8.2	0.80	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
OCDD	1700	B	16	1.1	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
OCDF	130	B	16	0.12	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total TCDD	1.4	J q	1.6	0.055	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total TCDF	1.6	q	1.6	0.039	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total PeCDD	5.6	J q	8.2	0.13	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total PeCDF	6.1	J q	8.2	0.092	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total HxCDD	62	B	8.2	0.12	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total HxCDF	37	B	8.2	0.16	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total HpCDD	640	B	8.2	3.3	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1
Total HpCDF	130	B	8.2	0.73	pg/g	☼	10/08/19 14:09	10/18/19 09:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*68*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-2,3,7,8-TCDF	*59*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-1,2,3,7,8-PeCDD	*71*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-1,2,3,7,8-PeCDF	*64*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-1,2,3,6,7,8-HxCDD	*58*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-1,2,3,4,7,8-HxCDF	*60*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*63*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*55*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*
13C-OCDD	*54*		*40 - 135*	*10/08/19 14:09*	*10/18/19 09:25*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	38.0		0.1	0.1	%			10/10/19 17:32	1
Percent Solids	62.0		0.1	0.1	%			10/10/19 17:32	1

Client Sample ID: G-02-02

Lab Sample ID: 320-55071-9
Date Collected: 10/02/19 11:06
Matrix: Solid
Date Received: 10/07/19 09:05
Percent Solids: 78.9

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		0.0061	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
2,4-D	ND		0.0061	0.00075	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
2,4-DB	ND		0.015	0.0065	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
Dicamba	ND		0.0073	0.0035	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
Dichlorprop	ND		0.0061	0.00077	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
MCPA	ND		0.0061	0.00071	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
MCPP	ND		0.0061	0.00057	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1
Silvex (2,4,5-TP)	ND		0.0061	0.00091	mg/Kg	☼	10/10/19 16:33	11/12/19 05:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*37*		*22 - 111*	*10/10/19 16:33*	*11/12/19 05:48*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	0.17	J q	1.3	0.041	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-02-02

Date Collected: 10/02/19 11:06
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-9

Matrix: Solid
Percent Solids: 78.9

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.50	J	1.3	0.033	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,7,8-PeCDD	0.63	J	6.4	0.097	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,7,8-PeCDF	0.35	J	6.4	0.042	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
2,3,4,7,8-PeCDF	0.59	J	6.4	0.043	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,4,7,8-HxCDD	1.6	J B	6.4	0.096	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,6,7,8-HxCDD	2.6	J	6.4	0.084	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,7,8,9-HxCDD	3.0	J	6.4	0.081	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,4,7,8-HxCDF	1.1	J	6.4	0.056	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,6,7,8-HxCDF	0.79	J	6.4	0.052	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,7,8,9-HxCDF	1.1	J B	6.4	0.058	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
2,3,4,6,7,8-HxCDF	0.84	J B	6.4	0.054	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,4,6,7,8-HpCDD	49	B	6.4	0.55	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,4,6,7,8-HpCDF	5.2	J B	6.4	0.13	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
1,2,3,4,7,8,9-HpCDF	2.1	J q	6.4	0.15	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
OCDD	280	B	13	0.22	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
OCDF	16	B	13	0.066	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total TCDD	0.71	J q	1.3	0.041	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total TCDF	1.8	q	1.3	0.033	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total PeCDD	3.4	J q	6.4	0.097	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total PeCDF	2.4	J q	6.4	0.043	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total HxCDD	21	q B	6.4	0.087	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total HxCDF	6.8	B	6.4	0.055	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total HpCDD	98	B	6.4	0.55	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1
Total HpCDF	13	q B	6.4	0.14	pg/g	☼	10/08/19 14:09	10/18/19 10:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*66*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-2,3,7,8-TCDF	*59*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-1,2,3,7,8-PeCDD	*68*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-1,2,3,7,8-PeCDF	*62*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-1,2,3,6,7,8-HxCDD	*55*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-1,2,3,4,7,8-HxCDF	*59*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*59*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*53*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*
13C-OCDD	*49*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:11*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	21.1		0.1	0.1	%			10/10/19 17:32	1
Percent Solids	78.9		0.1	0.1	%			10/10/19 17:32	1

Client Sample ID: G-02-01

Date Collected: 10/02/19 10:43
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-10

Matrix: Solid
Percent Solids: 70.0

Method: 8321A - Herbicides (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		0.0071	0.0013	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1
2,4-D	ND		0.0071	0.00087	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1
2,4-DB	ND		0.017	0.0076	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1
Dicamba	ND		0.0086	0.0041	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1

Client Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-02-01
Date Collected: 10/02/19 10:43
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-10
Matrix: Solid
Percent Solids: 70.0

Method: 8321A - Herbicides (LC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorprop	ND		0.0071	0.00090	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1
MCPA	ND		0.0071	0.00083	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1
MCPP	ND		0.0071	0.00067	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1
Silvex (2,4,5-TP)	ND		0.0071	0.0011	mg/Kg	☼	10/10/19 16:33	11/12/19 05:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*40*		*22 - 111*	*10/10/19 16:33*	*11/12/19 05:54*	*1*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	**0.17**	**J q**	1.4	0.042	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
2,3,7,8-TCDF	**0.35**	**J**	1.4	0.038	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,7,8-PeCDD	**0.42**	**J**	6.9	0.073	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,7,8-PeCDF	**0.19**	**J**	6.9	0.049	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
2,3,4,7,8-PeCDF	**0.27**	**J**	6.9	0.051	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,4,7,8-HxCDD	**1.3**	**J B**	6.9	0.14	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,6,7,8-HxCDD	**5.7**	**J**	6.9	0.12	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,7,8,9-HxCDD	**2.5**	**J**	6.9	0.12	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,4,7,8-HxCDF	**0.86**	**J**	6.9	0.14	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,6,7,8-HxCDF	**0.43**	**J**	6.9	0.13	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,7,8,9-HxCDF	**0.29**	**J q B**	6.9	0.14	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
2,3,4,6,7,8-HxCDF	**0.64**	**J B**	6.9	0.13	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,4,6,7,8-HpCDD	**170**	**B**	6.9	2.0	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,4,6,7,8-HpCDF	**22**	**B**	6.9	0.32	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
1,2,3,4,7,8,9-HpCDF	**1.1**	**J**	6.9	0.39	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
OCDD	**1500**	**B**	14	1.1	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
OCDF	**59**	**B**	14	0.080	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total TCDD	**0.59**	**J q**	1.4	0.042	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total TCDF	**0.98**	**J q**	1.4	0.038	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total PeCDD	**2.2**	**J q**	6.9	0.073	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total PeCDF	**2.8**	**J q**	6.9	0.050	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total HxCDD	**32**	**B**	6.9	0.13	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total HxCDF	**18**	**q B**	6.9	0.13	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total HpCDD	**320**	**B**	6.9	2.0	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1
Total HpCDF	**62**	**B**	6.9	0.35	pg/g	☼	10/08/19 14:09	10/18/19 10:57	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*61*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-2,3,7,8-TCDF	*55*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-1,2,3,7,8-PeCDD	*62*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-1,2,3,7,8-PeCDF	*58*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-1,2,3,6,7,8-HxCDD	*53*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-1,2,3,4,7,8-HxCDF	*54*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-1,2,3,4,6,7,8-HpCDD	*56*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*49*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*
13C-OCDD	*47*		*40 - 135*	*10/08/19 14:09*	*10/18/19 10:57*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**30.0**		0.1	0.1	%			10/14/19 09:51	1
Percent Solids	**70.0**		0.1	0.1	%			10/14/19 09:51	1

Eurofins TestAmerica, Sacramento

Toxicity Summary

Client: Weston Solutions, Inc. Job ID: 320-55071-1
Project/Site: START R9 - Guam Agent Orange

Client Sample ID: G-04-02 Lab Sample ID: 320-55071-1

Analyte	Result	Qualifier	Unit	WHO 2005 ND = EDL TEF	WHO 2005 ND = EDL TEQ	WHO 2005 ND = ½ EDL TEF	WHO 2005 ND = ½ EDL TEQ	WHO 2005 ND/EMPC = 0 TEF	WHO 2005 ND/EMPC = 0 TEQ	Method
2,3,7,8-TCDD	0.14	J q	pg/g	1	0.14	1	0.14	1	0.00	8290A
2,3,7,8-TCDF	0.61	J	pg/g	0.1	0.061	0.1	0.061	0.1	0.061	8290A
1,2,3,7,8-PeCDD	1.1	J	pg/g	1	1.1	1	1.1	1	1.1	8290A
1,2,3,7,8-PeCDF	0.54	J	pg/g	0.03	0.016	0.03	0.016	0.03	0.016	8290A
2,3,4,7,8-PeCDF	0.51	J q	pg/g	0.3	0.15	0.3	0.15	0.3	0.00	8290A
1,2,3,4,7,8-HxCDD	2.6	J B	pg/g	0.1	0.26	0.1	0.26	0.1	0.26	8290A
1,2,3,6,7,8-HxCDD	6.5	J	pg/g	0.1	0.65	0.1	0.65	0.1	0.65	8290A
1,2,3,7,8,9-HxCDD	6.3	J	pg/g	0.1	0.63	0.1	0.63	0.1	0.63	8290A
1,2,3,4,7,8-HxCDF	1.6	J	pg/g	0.1	0.16	0.1	0.16	0.1	0.16	8290A
1,2,3,6,7,8-HxCDF	0.95	J	pg/g	0.1	0.095	0.1	0.095	0.1	0.095	8290A
1,2,3,7,8,9-HxCDF	0.21	J q B	pg/g	0.1	0.021	0.1	0.021	0.1	0.00	8290A
2,3,4,6,7,8-HxCDF	1.1	J B	pg/g	0.1	0.11	0.1	0.11	0.1	0.11	8290A
1,2,3,4,6,7,8-HpCDD	190	B	pg/g	0.01	1.9	0.01	1.9	0.01	1.9	8290A
1,2,3,4,6,7,8-HpCDF	29	B	pg/g	0.01	0.29	0.01	0.29	0.01	0.29	8290A
1,2,3,4,7,8,9-HpCDF	1.0	J q	pg/g	0.01	0.010	0.01	0.010	0.01	0.00	8290A
OCDD	1500	B	pg/g	0.0003	0.45	0.0003	0.45	0.0003	0.45	8290A
OCDF	45	B	pg/g	0.0003	0.014	0.0003	0.014	0.0003	0.014	8290A
Total Dioxin/Furan TEQ			pg/g		6.1		6.1		5.7	TEQ

Client Sample ID: G-04-01 Lab Sample ID: 320-55071-2

Analyte	Result	Qualifier	Unit	WHO 2005 ND = EDL TEF	WHO 2005 ND = EDL TEQ	WHO 2005 ND = ½ EDL TEF	WHO 2005 ND = ½ EDL TEQ	WHO 2005 ND/EMPC = 0 TEF	WHO 2005 ND/EMPC = 0 TEQ	Method
2,3,7,8-TCDD	ND		pg/g	1	0.063	1	0.032	1	0.00	8290A
2,3,7,8-TCDF	0.78	J	pg/g	0.1	0.078	0.1	0.078	0.1	0.078	8290A
1,2,3,7,8-PeCDD	1.3	J	pg/g	1	1.3	1	1.3	1	1.3	8290A
1,2,3,7,8-PeCDF	0.70	J	pg/g	0.03	0.021	0.03	0.021	0.03	0.021	8290A
2,3,4,7,8-PeCDF	0.66	J	pg/g	0.3	0.20	0.3	0.20	0.3	0.20	8290A
1,2,3,4,7,8-HxCDD	4.2	J B	pg/g	0.1	0.42	0.1	0.42	0.1	0.42	8290A
1,2,3,6,7,8-HxCDD	11		pg/g	0.1	1.1	0.1	1.1	0.1	1.1	8290A
1,2,3,7,8,9-HxCDD	7.0		pg/g	0.1	0.70	0.1	0.70	0.1	0.70	8290A
1,2,3,4,7,8-HxCDF	1.9	J q	pg/g	0.1	0.19	0.1	0.19	0.1	0.00	8290A
1,2,3,6,7,8-HxCDF	1.1	J	pg/g	0.1	0.11	0.1	0.11	0.1	0.11	8290A
1,2,3,7,8,9-HxCDF	ND		pg/g	0.1	0.021	0.1	0.011	0.1	0.00	8290A
2,3,4,6,7,8-HxCDF	1.2	J B	pg/g	0.1	0.12	0.1	0.12	0.1	0.12	8290A
1,2,3,4,6,7,8-HpCDD	670	G B	pg/g	0.01	6.7	0.01	6.7	0.01	6.7	8290A
1,2,3,4,6,7,8-HpCDF	51	B	pg/g	0.01	0.51	0.01	0.51	0.01	0.51	8290A
1,2,3,4,7,8,9-HpCDF	1.6	J	pg/g	0.01	0.016	0.01	0.016	0.01	0.016	8290A
OCDD	4100	B	pg/g	0.0003	1.2	0.0003	1.2	0.0003	1.2	8290A
OCDF	170	B	pg/g	0.0003	0.051	0.0003	0.051	0.0003	0.051	8290A
Total Dioxin/Furan TEQ			pg/g		13		13		13	TEQ

TEF Reference:

WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners
WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners
WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners

Note: The analytes PCB-156 and PCB-157 coelute as a single peak.

Eurofins TestAmerica, Sacramento

Toxicity Summary

Client: Weston Solutions, Inc. Job ID: 320-55071-1
Project/Site: START R9 - Guam Agent Orange

Client Sample ID: G-04-02-D — Lab Sample ID: 320-55071-3

Analyte	Result	Qualifier	Unit	WHO 2005 ND = EDL TEF	WHO 2005 ND = EDL TEQ	WHO 2005 ND = ½ EDL TEF	WHO 2005 ND = ½ EDL TEQ	WHO 2005 ND/EMPC = 0 TEF	WHO 2005 ND/EMPC = 0 TEQ	Method
2,3,7,8-TCDD	0.23	J q	pg/g	1	0.23	1	0.23	1	0.00	8290A
2,3,7,8-TCDF	0.77	J	pg/g	0.1	0.077	0.1	0.077	0.1	0.077	8290A
1,2,3,7,8-PeCDD	1.3	J	pg/g	1	1.3	1	1.3	1	1.3	8290A
1,2,3,7,8-PeCDF	0.58	J	pg/g	0.03	0.017	0.03	0.017	0.03	0.017	8290A
2,3,4,7,8-PeCDF	0.68	J	pg/g	0.3	0.20	0.3	0.20	0.3	0.20	8290A
1,2,3,4,7,8-HxCDD	3.3	J B	pg/g	0.1	0.33	0.1	0.33	0.1	0.33	8290A
1,2,3,6,7,8-HxCDD	8.1		pg/g	0.1	0.81	0.1	0.81	0.1	0.81	8290A
1,2,3,7,8,9-HxCDD	7.2		pg/g	0.1	0.72	0.1	0.72	0.1	0.72	8290A
1,2,3,4,7,8-HxCDF	2.2	J	pg/g	0.1	0.22	0.1	0.22	0.1	0.22	8290A
1,2,3,6,7,8-HxCDF	1.5	J	pg/g	0.1	0.15	0.1	0.15	0.1	0.15	8290A
1,2,3,7,8,9-HxCDF	0.62	J B	pg/g	0.1	0.062	0.1	0.062	0.1	0.062	8290A
2,3,4,6,7,8-HxCDF	1.6	J B	pg/g	0.1	0.16	0.1	0.16	0.1	0.16	8290A
1,2,3,4,6,7,8-HpCDD	230	B	pg/g	0.01	2.3	0.01	2.3	0.01	2.3	8290A
1,2,3,4,6,7,8-HpCDF	35	B	pg/g	0.01	0.35	0.01	0.35	0.01	0.35	8290A
1,2,3,4,7,8,9-HpCDF	2.0	J	pg/g	0.01	0.020	0.01	0.020	0.01	0.020	8290A
OCDD	1900	B	pg/g	0.0003	0.57	0.0003	0.57	0.0003	0.57	8290A
OCDF	62	B	pg/g	0.0003	0.019	0.0003	0.019	0.0003	0.019	8290A
Total Dioxin/Furan TEQ			pg/g		7.5		7.5		7.3	TEQ

Client Sample ID: G-01-01-D — Lab Sample ID: 320-55071-4

Analyte	Result	Qualifier	Unit	WHO 2005 ND = EDL TEF	WHO 2005 ND = EDL TEQ	WHO 2005 ND = ½ EDL TEF	WHO 2005 ND = ½ EDL TEQ	WHO 2005 ND/EMPC = 0 TEF	WHO 2005 ND/EMPC = 0 TEQ	Method
2,3,7,8-TCDD	0.19	J q	pg/g	1	0.19	1	0.19	1	0.00	8290A
2,3,7,8-TCDF	0.26	J	pg/g	0.1	0.026	0.1	0.026	0.1	0.026	8290A
1,2,3,7,8-PeCDD	1.5	J	pg/g	1	1.5	1	1.5	1	1.5	8290A
1,2,3,7,8-PeCDF	0.31	J	pg/g	0.03	0.0093	0.03	0.0093	0.03	0.0093	8290A
2,3,4,7,8-PeCDF	0.33	J	pg/g	0.3	0.099	0.3	0.099	0.3	0.099	8290A
1,2,3,4,7,8-HxCDD	3.5	J B	pg/g	0.1	0.35	0.1	0.35	0.1	0.35	8290A
1,2,3,6,7,8-HxCDD	9.6		pg/g	0.1	0.96	0.1	0.96	0.1	0.96	8290A
1,2,3,7,8,9-HxCDD	8.1		pg/g	0.1	0.81	0.1	0.81	0.1	0.81	8290A
1,2,3,4,7,8-HxCDF	1.2	J	pg/g	0.1	0.12	0.1	0.12	0.1	0.12	8290A
1,2,3,6,7,8-HxCDF	0.70	J	pg/g	0.1	0.070	0.1	0.070	0.1	0.070	8290A
1,2,3,7,8,9-HxCDF	0.27	J B	pg/g	0.1	0.027	0.1	0.027	0.1	0.027	8290A
2,3,4,6,7,8-HxCDF	0.78	J B	pg/g	0.1	0.078	0.1	0.078	0.1	0.078	8290A
1,2,3,4,6,7,8-HpCDD	250	B	pg/g	0.01	2.5	0.01	2.5	0.01	2.5	8290A
1,2,3,4,6,7,8-HpCDF	18	B	pg/g	0.01	0.18	0.01	0.18	0.01	0.18	8290A
1,2,3,4,7,8,9-HpCDF	1.0	J	pg/g	0.01	0.010	0.01	0.010	0.01	0.010	8290A
OCDD	1900	B	pg/g	0.0003	0.57	0.0003	0.57	0.0003	0.57	8290A
OCDF	29	B	pg/g	0.0003	0.0087	0.0003	0.0087	0.0003	0.0087	8290A
Total Dioxin/Furan TEQ			pg/g		7.5		7.5		7.3	TEQ

TEF Reference:

WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners
WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners
WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners

Note: The analytes PCB-156 and PCB-157 coelute as a single peak.

Eurofins TestAmerica, Sacramento

Toxicity Summary

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-01-01 — Lab Sample ID: 320-55071-5

Analyte	Result	Qualifier	Unit	WHO 2005 ND = EDL TEF	WHO 2005 ND = EDL TEQ	WHO 2005 ND = ½ EDL TEF	WHO 2005 ND = ½ EDL TEQ	WHO 2005 ND/EMPC = 0 TEF	WHO 2005 ND/EMPC = 0 TEQ	Method
2,3,7,8-TCDD	ND		pg/g	1	0.13	1	0.065	1	0.00	8290A
2,3,7,8-TCDF	0.32	J	pg/g	0.1	0.032	0.1	0.032	0.1	0.032	8290A
1,2,3,7,8-PeCDD	1.4	J	pg/g	1	1.4	1	1.4	1	1.4	8290A
1,2,3,7,8-PeCDF	0.34	J	pg/g	0.03	0.010	0.03	0.010	0.03	0.010	8290A
2,3,4,7,8-PeCDF	ND		pg/g	0.3	0.039	0.3	0.020	0.3	0.00	8290A
1,2,3,4,7,8-HxCDD	3.2	J B	pg/g	0.1	0.32	0.1	0.32	0.1	0.32	8290A
1,2,3,6,7,8-HxCDD	7.6	J	pg/g	0.1	0.76	0.1	0.76	0.1	0.76	8290A
1,2,3,7,8,9-HxCDD	7.2	J	pg/g	0.1	0.72	0.1	0.72	0.1	0.72	8290A
1,2,3,4,7,8-HxCDF	0.90	J	pg/g	0.1	0.090	0.1	0.090	0.1	0.090	8290A
1,2,3,6,7,8-HxCDF	0.62	J	pg/g	0.1	0.062	0.1	0.062	0.1	0.062	8290A
1,2,3,7,8,9-HxCDF	0.43	J B	pg/g	0.1	0.043	0.1	0.043	0.1	0.043	8290A
2,3,4,6,7,8-HxCDF	0.70	J B	pg/g	0.1	0.070	0.1	0.070	0.1	0.070	8290A
1,2,3,4,6,7,8-HpCDD	210	B F1	pg/g	0.01	2.1	0.01	2.1	0.01	2.1	8290A
1,2,3,4,6,7,8-HpCDF	15	B	pg/g	0.01	0.15	0.01	0.15	0.01	0.15	8290A
1,2,3,4,7,8,9-HpCDF	ND		pg/g	0.01	0.0045	0.01	0.0023	0.01	0.00	8290A
OCDD	1700	B F2	pg/g	0.0003	0.51	0.0003	0.51	0.0003	0.51	8290A
OCDF	30	B	pg/g	0.0003	0.0090	0.0003	0.0090	0.0003	0.0090	8290A
Total Dioxin/Furan TEQ			pg/g		6.4		6.4		6.3	TEQ

Client Sample ID: G-03-01 — Lab Sample ID: 320-55071-6

Analyte	Result	Qualifier	Unit	WHO 2005 ND = EDL TEF	WHO 2005 ND = EDL TEQ	WHO 2005 ND = ½ EDL TEF	WHO 2005 ND = ½ EDL TEQ	WHO 2005 ND/EMPC = 0 TEF	WHO 2005 ND/EMPC = 0 TEQ	Method
2,3,7,8-TCDD	1.3		pg/g	1	1.3	1	1.3	1	1.3	8290A
2,3,7,8-TCDF	0.69	J	pg/g	0.1	0.069	0.1	0.069	0.1	0.069	8290A
1,2,3,7,8-PeCDD	0.63	J	pg/g	1	0.63	1	0.63	1	0.63	8290A
1,2,3,7,8-PeCDF	0.16	J q	pg/g	0.03	0.0048	0.03	0.0048	0.03	0.00	8290A
2,3,4,7,8-PeCDF	0.19	J	pg/g	0.3	0.057	0.3	0.057	0.3	0.057	8290A
1,2,3,4,7,8-HxCDD	1.6	J B	pg/g	0.1	0.16	0.1	0.16	0.1	0.16	8290A
1,2,3,6,7,8-HxCDD	3.1	J	pg/g	0.1	0.31	0.1	0.31	0.1	0.31	8290A
1,2,3,7,8,9-HxCDD	3.5	J	pg/g	0.1	0.35	0.1	0.35	0.1	0.35	8290A
1,2,3,4,7,8-HxCDF	0.52	J	pg/g	0.1	0.052	0.1	0.052	0.1	0.052	8290A
1,2,3,6,7,8-HxCDF	0.35	J	pg/g	0.1	0.035	0.1	0.035	0.1	0.035	8290A
1,2,3,7,8,9-HxCDF	0.21	J B	pg/g	0.1	0.021	0.1	0.021	0.1	0.021	8290A
2,3,4,6,7,8-HxCDF	0.37	J B	pg/g	0.1	0.037	0.1	0.037	0.1	0.037	8290A
1,2,3,4,6,7,8-HpCDD	140	B	pg/g	0.01	1.4	0.01	1.4	0.01	1.4	8290A
1,2,3,4,6,7,8-HpCDF	13	B	pg/g	0.01	0.13	0.01	0.13	0.01	0.13	8290A
1,2,3,4,7,8,9-HpCDF	0.63	J	pg/g	0.01	0.0063	0.01	0.0063	0.01	0.0063	8290A
OCDD	1000	B	pg/g	0.0003	0.30	0.0003	0.30	0.0003	0.30	8290A
OCDF	33	B	pg/g	0.0003	0.0099	0.0003	0.0099	0.0003	0.0099	8290A
Total Dioxin/Furan TEQ			pg/g		4.9		4.9		4.9	TEQ

TEF Reference:

WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners
WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners
WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners

Note: The analytes PCB-156 and PCB-157 coelute as a single peak.

Eurofins TestAmerica, Sacramento

Toxicity Summary

Client: Weston Solutions, Inc. Job ID: 320-55071-1
Project/Site: START R9 - Guam Agent Orange

Client Sample ID: G-03-02 Lab Sample ID: 320-55071-7

Analyte	Result	Qualifier	Unit	WHO 2005 ND = EDL TEF	WHO 2005 ND = EDL TEQ	WHO 2005 ND = ½ EDL TEF	WHO 2005 ND = ½ EDL TEQ	WHO 2005 ND/EMPC = 0 TEF	WHO 2005 ND/EMPC = 0 TEQ	Method
2,3,7,8-TCDD	1.6	q	pg/g	1	1.6	1	1.6	1	0.00	8290A
1,2,3,7,8-PeCDD	0.78	J	pg/g	1	0.78	1	0.78	1	0.78	8290A
1,2,3,7,8-PeCDF	0.30	J	pg/g	0.03	0.0090	0.03	0.0090	0.03	0.0090	8290A
2,3,4,7,8-PeCDF	0.28	J	pg/g	0.3	0.084	0.3	0.084	0.3	0.084	8290A
1,2,3,4,7,8-HxCDD	1.6	J B	pg/g	0.1	0.16	0.1	0.16	0.1	0.16	8290A
1,2,3,6,7,8-HxCDD	4.4	J	pg/g	0.1	0.44	0.1	0.44	0.1	0.44	8290A
1,2,3,7,8,9-HxCDD	4.0	J	pg/g	0.1	0.40	0.1	0.40	0.1	0.40	8290A
1,2,3,4,7,8-HxCDF	0.68	J	pg/g	0.1	0.068	0.1	0.068	0.1	0.068	8290A
1,2,3,6,7,8-HxCDF	0.49	J	pg/g	0.1	0.049	0.1	0.049	0.1	0.049	8290A
1,2,3,7,8,9-HxCDF	0.21	J q B	pg/g	0.1	0.021	0.1	0.021	0.1	0.00	8290A
2,3,4,6,7,8-HxCDF	0.59	J B	pg/g	0.1	0.059	0.1	0.059	0.1	0.059	8290A
1,2,3,4,6,7,8-HpCDD	150	B	pg/g	0.01	1.5	0.01	1.5	0.01	1.5	8290A
1,2,3,4,6,7,8-HpCDF	19	B	pg/g	0.01	0.19	0.01	0.19	0.01	0.19	8290A
1,2,3,4,7,8,9-HpCDF	0.57	J	pg/g	0.01	0.0057	0.01	0.0057	0.01	0.0057	8290A
OCDD	1200	B	pg/g	0.0003	0.36	0.0003	0.36	0.0003	0.36	8290A
OCDF	32	B	pg/g	0.0003	0.0096	0.0003	0.0096	0.0003	0.0096	8290A
2,3,7,8-TCDF - RA	0.75	J	pg/g	0.1	0.075	0.1	0.075	0.1	0.075	8290A
Total Dioxin/Furan TEQ			pg/g		5.8		5.8		4.2	TEQ

Client Sample ID: G-02-03 Lab Sample ID: 320-55071-8

Analyte	Result	Qualifier	Unit	WHO 2005 ND = EDL TEF	WHO 2005 ND = EDL TEQ	WHO 2005 ND = ½ EDL TEF	WHO 2005 ND = ½ EDL TEQ	WHO 2005 ND/EMPC = 0 TEF	WHO 2005 ND/EMPC = 0 TEQ	Method
2,3,7,8-TCDD	0.60	J	pg/g	1	0.60	1	0.60	1	0.60	8290A
2,3,7,8-TCDF	0.28	J	pg/g	0.1	0.028	0.1	0.028	0.1	0.028	8290A
1,2,3,7,8-PeCDD	1.3	J	pg/g	1	1.3	1	1.3	1	1.3	8290A
1,2,3,7,8-PeCDF	0.42	J	pg/g	0.03	0.013	0.03	0.013	0.03	0.013	8290A
2,3,4,7,8-PeCDF	0.61	J	pg/g	0.3	0.18	0.3	0.18	0.3	0.18	8290A
1,2,3,4,7,8-HxCDD	3.3	J B	pg/g	0.1	0.33	0.1	0.33	0.1	0.33	8290A
1,2,3,6,7,8-HxCDD	5.4	J	pg/g	0.1	0.54	0.1	0.54	0.1	0.54	8290A
1,2,3,7,8,9-HxCDD	5.9	J	pg/g	0.1	0.59	0.1	0.59	0.1	0.59	8290A
1,2,3,4,7,8-HxCDF	2.1	J	pg/g	0.1	0.21	0.1	0.21	0.1	0.21	8290A
1,2,3,6,7,8-HxCDF	1.9	J	pg/g	0.1	0.19	0.1	0.19	0.1	0.19	8290A
1,2,3,7,8,9-HxCDF	0.91	J B	pg/g	0.1	0.091	0.1	0.091	0.1	0.091	8290A
2,3,4,6,7,8-HxCDF	2.2	J B	pg/g	0.1	0.22	0.1	0.22	0.1	0.22	8290A
1,2,3,4,6,7,8-HpCDD	200	B	pg/g	0.01	2.0	0.01	2.0	0.01	2.0	8290A
1,2,3,4,6,7,8-HpCDF	58	B	pg/g	0.01	0.58	0.01	0.58	0.01	0.58	8290A
1,2,3,4,7,8,9-HpCDF	3.1	J	pg/g	0.01	0.031	0.01	0.031	0.01	0.031	8290A
OCDD	1700	B	pg/g	0.0003	0.51	0.0003	0.51	0.0003	0.51	8290A
OCDF	130	B	pg/g	0.0003	0.039	0.0003	0.039	0.0003	0.039	8290A
Total Dioxin/Furan TEQ			pg/g		7.5		7.5		7.5	TEQ

TEF Reference:

WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners
WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners
WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners

Note: The analytes PCB-156 and PCB-157 coelute as a single peak.

Eurofins TestAmerica, Sacramento

Toxicity Summary

Client: Weston Solutions, Inc. Job ID: 320-55071-1
Project/Site: START R9 - Guam Agent Orange

Client Sample ID: G-02-02 Lab Sample ID: 320-55071-9

Analyte	Result	Qualifier	Unit	WHO 2005 ND = EDL TEF	WHO 2005 ND = EDL TEQ	WHO 2005 ND = ½ EDL TEF	WHO 2005 ND = ½ EDL TEQ	WHO 2005 ND/EMPC = 0 TEF	WHO 2005 ND/EMPC = 0 TEQ	Method
2,3,7,8-TCDD	0.17	J q	pg/g	1	0.17	1	0.17	1	0.00	8290A
2,3,7,8-TCDF	0.50	J	pg/g	0.1	0.050	0.1	0.050	0.1	0.050	8290A
1,2,3,7,8-PeCDD	0.63	J	pg/g	1	0.63	1	0.63	1	0.63	8290A
1,2,3,7,8-PeCDF	0.35	J	pg/g	0.03	0.011	0.03	0.011	0.03	0.011	8290A
2,3,4,7,8-PeCDF	0.59	J	pg/g	0.3	0.18	0.3	0.18	0.3	0.18	8290A
1,2,3,4,7,8-HxCDD	1.6	J B	pg/g	0.1	0.16	0.1	0.16	0.1	0.16	8290A
1,2,3,6,7,8-HxCDD	2.6	J	pg/g	0.1	0.26	0.1	0.26	0.1	0.26	8290A
1,2,3,7,8,9-HxCDD	3.0	J	pg/g	0.1	0.30	0.1	0.30	0.1	0.30	8290A
1,2,3,4,7,8-HxCDF	1.1	J	pg/g	0.1	0.11	0.1	0.11	0.1	0.11	8290A
1,2,3,6,7,8-HxCDF	0.79	J	pg/g	0.1	0.079	0.1	0.079	0.1	0.079	8290A
1,2,3,7,8,9-HxCDF	1.1	J B	pg/g	0.1	0.11	0.1	0.11	0.1	0.11	8290A
2,3,4,6,7,8-HxCDF	0.84	J B	pg/g	0.1	0.084	0.1	0.084	0.1	0.084	8290A
1,2,3,4,6,7,8-HpCDD	49	B	pg/g	0.01	0.49	0.01	0.49	0.01	0.49	8290A
1,2,3,4,6,7,8-HpCDF	5.2	J B	pg/g	0.01	0.052	0.01	0.052	0.01	0.052	8290A
1,2,3,4,7,8,9-HpCDF	2.1	J q	pg/g	0.01	0.021	0.01	0.021	0.01	0.00	8290A
OCDD	280	B	pg/g	0.0003	0.084	0.0003	0.084	0.0003	0.084	8290A
OCDF	16	B	pg/g	0.0003	0.0048	0.0003	0.0048	0.0003	0.0048	8290A
Total Dioxin/Furan TEQ			pg/g		2.8		2.8		2.6	TEQ

Client Sample ID: G-02-01 Lab Sample ID: 320-55071-10

Analyte	Result	Qualifier	Unit	WHO 2005 ND = EDL TEF	WHO 2005 ND = EDL TEQ	WHO 2005 ND = ½ EDL TEF	WHO 2005 ND = ½ EDL TEQ	WHO 2005 ND/EMPC = 0 TEF	WHO 2005 ND/EMPC = 0 TEQ	Method
2,3,7,8-TCDD	0.17	J q	pg/g	1	0.17	1	0.17	1	0.00	8290A
2,3,7,8-TCDF	0.35	J	pg/g	0.1	0.035	0.1	0.035	0.1	0.035	8290A
1,2,3,7,8-PeCDD	0.42	J	pg/g	1	0.42	1	0.42	1	0.42	8290A
1,2,3,7,8-PeCDF	0.19	J	pg/g	0.03	0.0057	0.03	0.0057	0.03	0.0057	8290A
2,3,4,7,8-PeCDF	0.27	J	pg/g	0.3	0.081	0.3	0.081	0.3	0.081	8290A
1,2,3,4,7,8-HxCDD	1.3	J B	pg/g	0.1	0.13	0.1	0.13	0.1	0.13	8290A
1,2,3,6,7,8-HxCDD	5.7	J	pg/g	0.1	0.57	0.1	0.57	0.1	0.57	8290A
1,2,3,7,8,9-HxCDD	2.5	J	pg/g	0.1	0.25	0.1	0.25	0.1	0.25	8290A
1,2,3,4,7,8-HxCDF	0.86	J	pg/g	0.1	0.086	0.1	0.086	0.1	0.086	8290A
1,2,3,6,7,8-HxCDF	0.43	J	pg/g	0.1	0.043	0.1	0.043	0.1	0.043	8290A
1,2,3,7,8,9-HxCDF	0.29	J q B	pg/g	0.1	0.029	0.1	0.029	0.1	0.00	8290A
2,3,4,6,7,8-HxCDF	0.64	J B	pg/g	0.1	0.064	0.1	0.064	0.1	0.064	8290A
1,2,3,4,6,7,8-HpCDD	170	B	pg/g	0.01	1.7	0.01	1.7	0.01	1.7	8290A
1,2,3,4,6,7,8-HpCDF	22	B	pg/g	0.01	0.22	0.01	0.22	0.01	0.22	8290A
1,2,3,4,7,8,9-HpCDF	1.1	J	pg/g	0.01	0.011	0.01	0.011	0.01	0.011	8290A
OCDD	1500	B	pg/g	0.0003	0.45	0.0003	0.45	0.0003	0.45	8290A
OCDF	59	B	pg/g	0.0003	0.018	0.0003	0.018	0.0003	0.018	8290A
Total Dioxin/Furan TEQ			pg/g		4.3		4.3		4.1	TEQ

TEF Reference:

WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners
WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners
WHO 2005 = World Health Organization (WHO) 2005 TEF, Dioxins, Furans and PCB Congeners

Note: The analytes PCB-156 and PCB-157 coelute as a single peak.

Eurofins TestAmerica, Sacramento

Surrogate Summary

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Method: 8321A - Herbicides (LC/MS)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	DCPAA (22-111)
320-55071-1	G-04-02	30
320-55071-2	G-04-01	47
320-55071-3	G-04-02-D	33
320-55071-4	G-01-01-D	42
320-55071-5	G-01-01	33
320-55071-5 MS	G-01-01	46
320-55071-5 MSD	G-01-01	27
320-55071-6	G-03-01	32
320-55071-7	G-03-02	35
320-55071-8	G-02-03	37
320-55071-9	G-02-02	37
320-55071-10	G-02-01	40
LCS 280-473626/2-A	Lab Control Sample	45
MB 280-473626/1-A	Method Blank	48

Surrogate Legend

DCPAA = 2,4-Dichlorophenylacetic acid

Isotope Dilution Summary

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Matrix: Solid

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	TCDD (40-135)	TCDF (40-135)	PeCDD (40-135)	PeCDF (40-135)	HxDD (40-135)	HxCDF (40-135)	HpCDD (40-135)	HpCDF (40-135)
320-55071-1	G-04-02	71	63	70	69	58	63	64	60
320-55071-2	G-04-01	68	60	74	68	64	64	71	64
320-55071-3	G-04-02-D	68	62	66	71	65	72	53	54
320-55071-4	G-01-01-D	68	60	71	65	61	65	68	63
320-55071-5	G-01-01	71	64	73	68	61	61	68	59
320-55071-5 MS	G-01-01	63	57	65	60	51	54	58	50
320-55071-5 MSD	G-01-01	64	56	69	62	55	58	63	55
320-55071-6	G-03-01	69	59	76	68	63	65	73	67
320-55071-7	G-03-02	66	58	72	64	61	64	69	65
320-55071-7 - RA	G-03-02		67						
320-55071-8	G-02-03	68	59	71	64	58	60	63	55
320-55071-9	G-02-02	66	59	68	62	55	59	59	53
320-55071-10	G-02-01	61	55	62	58	53	54	56	49
LCS 320-329327/2-A	Lab Control Sample	70	59	73	67	63	64	67	63
MB 320-329327/1-A	Method Blank	71	62	73	68	68	69	70	66

		Percent Isotope Dilution Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	OCDD (40-135)
320-55071-1	G-04-02	62
320-55071-2	G-04-01	67
320-55071-3	G-04-02-D	46
320-55071-4	G-01-01-D	66
320-55071-5	G-01-01	60
320-55071-5 MS	G-01-01	53
320-55071-5 MSD	G-01-01	57
320-55071-6	G-03-01	67
320-55071-7	G-03-02	64
320-55071-7 - RA	G-03-02	
320-55071-8	G-02-03	54
320-55071-9	G-02-02	49
320-55071-10	G-02-01	47
LCS 320-329327/2-A	Lab Control Sample	61
MB 320-329327/1-A	Method Blank	63

Surrogate Legend

TCDD = 13C-2,3,7,8-TCDD
TCDF = 13C-2,3,7,8-TCDF
PeCDD = 13C-1,2,3,7,8-PeCDD
PeCDF = 13C-1,2,3,7,8-PeCDF
HxDD = 13C-1,2,3,6,7,8-HxCDD
HxCDF = 13C-1,2,3,4,7,8-HxCDF
HpCDD = 13C-1,2,3,4,6,7,8-HpCDD
HpCDF = 13C-1,2,3,4,6,7,8-HpCDF
OCDD = 13C-OCDD

QC Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Method: 8321A - Herbicides (LC/MS)

Lab Sample ID: MB 280-473626/1-A
Matrix: Solid
Analysis Batch: 477353

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 473626

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		0.0050	0.00089	mg/Kg		10/10/19 16:33	11/12/19 04:28	1
2,4-D	ND		0.0050	0.00061	mg/Kg		10/10/19 16:33	11/12/19 04:28	1
2,4-DB	ND		0.012	0.0053	mg/Kg		10/10/19 16:33	11/12/19 04:28	1
Dicamba	ND		0.0060	0.0029	mg/Kg		10/10/19 16:33	11/12/19 04:28	1
Dichlorprop	ND		0.0050	0.00063	mg/Kg		10/10/19 16:33	11/12/19 04:28	1
MCPA	ND		0.0050	0.00058	mg/Kg		10/10/19 16:33	11/12/19 04:28	1
MCPP	ND		0.0050	0.00047	mg/Kg		10/10/19 16:33	11/12/19 04:28	1
Silvex (2,4,5-TP)	ND		0.0050	0.00074	mg/Kg		10/10/19 16:33	11/12/19 04:28	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*48*		*22 - 111*	*10/10/19 16:33*	*11/12/19 04:28*	*1*

Lab Sample ID: LCS 280-473626/2-A
Matrix: Solid
Analysis Batch: 477353

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 473626

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4,5-T	0.0100	0.00613		mg/Kg		61	30 - 130
2,4-D	0.0100	0.00639		mg/Kg		64	30 - 130
2,4-DB	0.0100	ND		mg/Kg		50	50 - 130
Dicamba	0.0100	0.00553	J	mg/Kg		55	50 - 130
Dichlorprop	0.0100	0.00583		mg/Kg		58	50 - 130
MCPA	0.0100	0.00570		mg/Kg		57	50 - 130
MCPP	0.0100	0.00594		mg/Kg		59	50 - 130
Silvex (2,4,5-TP)	0.0100	0.00479	J	mg/Kg		48	30 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*45*		*22 - 111*

Lab Sample ID: 320-55071-5 MS
Matrix: Solid
Analysis Batch: 477353

Client Sample ID: G-01-01
Prep Type: Total/NA
Prep Batch: 473626

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4,5-T	ND		0.0144	0.00764		mg/Kg	☼	53	30 - 130
2,4-D	ND		0.0144	0.00959		mg/Kg	☼	66	30 - 130
2,4-DB	ND	F1	0.0144	ND	F1	mg/Kg	☼	0	50 - 130
Dicamba	ND	F1	0.0144	0.00813	J	mg/Kg	☼	56	50 - 130
Dichlorprop	ND		0.0144	0.00765		mg/Kg	☼	53	50 - 130
MCPA	ND		0.0144	0.00858		mg/Kg	☼	59	50 - 130
MCPP	ND		0.0144	0.00834		mg/Kg	☼	58	50 - 130
Silvex (2,4,5-TP)	ND		0.0144	0.00817		mg/Kg	☼	57	30 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*46*		*22 - 111*

QC Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Method: 8321A - Herbicides (LC/MS) (Continued)

Lab Sample ID: 320-55071-5 MSD
Matrix: Solid
Analysis Batch: 477353

Client Sample ID: G-01-01
Prep Type: Total/NA
Prep Batch: 473626

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4,5-T	ND		0.0148	0.00664	J	mg/Kg	☼	45	30 - 130	14	40
2,4-D	ND		0.0148	0.00712	J	mg/Kg	☼	48	30 - 130	30	40
2,4-DB	ND	F1	0.0148	ND	F1	mg/Kg	☼	0	50 - 130	NC	40
Dicamba	ND	F1	0.0148	0.00733	J F1	mg/Kg	☼	49	50 - 130	10	40
Dichlorprop	ND		0.0148	0.00810		mg/Kg	☼	55	50 - 130	6	40
MCPA	ND		0.0148	0.00741		mg/Kg	☼	50	50 - 130	15	40
MCPP	ND		0.0148	0.00751		mg/Kg	☼	51	50 - 130	10	40
Silvex (2,4,5-TP)	ND		0.0148	0.00716	J	mg/Kg	☼	48	30 - 130	13	40

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*27*		*22 - 111*

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Lab Sample ID: MB 320-329327/1-A
Matrix: Solid
Analysis Batch: 331857

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 329327

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDD	ND		1.0	0.045	pg/g		10/08/19 14:09	10/17/19 18:08	1
2,3,7,8-TCDF	ND		1.0	0.026	pg/g		10/08/19 14:09	10/17/19 18:08	1
1,2,3,7,8-PeCDD	ND		5.0	0.044	pg/g		10/08/19 14:09	10/17/19 18:08	1
1,2,3,7,8-PeCDF	ND		5.0	0.034	pg/g		10/08/19 14:09	10/17/19 18:08	1
2,3,4,7,8-PeCDF	ND		5.0	0.035	pg/g		10/08/19 14:09	10/17/19 18:08	1
1,2,3,4,7,8-HxCDD	0.239	J	5.0	0.031	pg/g		10/08/19 14:09	10/17/19 18:08	1
1,2,3,6,7,8-HxCDD	ND		5.0	0.027	pg/g		10/08/19 14:09	10/17/19 18:08	1
1,2,3,7,8,9-HxCDD	ND		5.0	0.026	pg/g		10/08/19 14:09	10/17/19 18:08	1
1,2,3,4,7,8-HxCDF	ND		5.0	0.027	pg/g		10/08/19 14:09	10/17/19 18:08	1
1,2,3,6,7,8-HxCDF	ND		5.0	0.025	pg/g		10/08/19 14:09	10/17/19 18:08	1
1,2,3,7,8,9-HxCDF	0.0802	J q	5.0	0.028	pg/g		10/08/19 14:09	10/17/19 18:08	1
2,3,4,6,7,8-HxCDF	0.0418	J	5.0	0.026	pg/g		10/08/19 14:09	10/17/19 18:08	1
1,2,3,4,6,7,8-HpCDD	0.114	J	5.0	0.026	pg/g		10/08/19 14:09	10/17/19 18:08	1
1,2,3,4,6,7,8-HpCDF	0.0727	J q	5.0	0.026	pg/g		10/08/19 14:09	10/17/19 18:08	1
1,2,3,4,7,8,9-HpCDF	ND		5.0	0.032	pg/g		10/08/19 14:09	10/17/19 18:08	1
OCDD	0.726	J	10	0.036	pg/g		10/08/19 14:09	10/17/19 18:08	1
OCDF	0.200	J	10	0.037	pg/g		10/08/19 14:09	10/17/19 18:08	1
Total TCDD	ND		1.0	0.045	pg/g		10/08/19 14:09	10/17/19 18:08	1
Total TCDF	ND		1.0	0.026	pg/g		10/08/19 14:09	10/17/19 18:08	1
Total PeCDD	ND		5.0	0.044	pg/g		10/08/19 14:09	10/17/19 18:08	1
Total PeCDF	ND		5.0	0.044	pg/g		10/08/19 14:09	10/17/19 18:08	1
Total HxCDD	0.239	J	5.0	0.028	pg/g		10/08/19 14:09	10/17/19 18:08	1
Total HxCDF	0.122	J q	5.0	0.026	pg/g		10/08/19 14:09	10/17/19 18:08	1
Total HpCDD	0.235	J	5.0	0.026	pg/g		10/08/19 14:09	10/17/19 18:08	1
Total HpCDF	0.0727	J q	5.0	0.029	pg/g		10/08/19 14:09	10/17/19 18:08	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDD	*71*		*40 - 135*	*10/08/19 14:09*	*10/17/19 18:08*	*1*
13C-2,3,7,8-TCDF	*62*		*40 - 135*	*10/08/19 14:09*	*10/17/19 18:08*	*1*

QC Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: MB 320-329327/1-A
Matrix: Solid
Analysis Batch: 331857

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 329327

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,7,8-PeCDD	73		40 - 135	10/08/19 14:09	10/17/19 18:08	1
13C-1,2,3,7,8-PeCDF	68		40 - 135	10/08/19 14:09	10/17/19 18:08	1
13C-1,2,3,6,7,8-HxCDD	68		40 - 135	10/08/19 14:09	10/17/19 18:08	1
13C-1,2,3,4,7,8-HxCDF	69		40 - 135	10/08/19 14:09	10/17/19 18:08	1
13C-1,2,3,4,6,7,8-HpCDD	70		40 - 135	10/08/19 14:09	10/17/19 18:08	1
13C-1,2,3,4,6,7,8-HpCDF	66		40 - 135	10/08/19 14:09	10/17/19 18:08	1
13C-OCDD	63		40 - 135	10/08/19 14:09	10/17/19 18:08	1

Lab Sample ID: LCS 320-329327/2-A
Matrix: Solid
Analysis Batch: 331857

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 329327

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,3,7,8-TCDD	20.0	19.1		pg/g		96	77 - 130
2,3,7,8-TCDF	20.0	21.0		pg/g		105	79 - 137
1,2,3,7,8-PeCDD	100	110		pg/g		110	79 - 134
1,2,3,7,8-PeCDF	100	104		pg/g		104	81 - 134
2,3,4,7,8-PeCDF	100	105		pg/g		105	76 - 132
1,2,3,4,7,8-HxCDD	100	114		pg/g		114	65 - 144
1,2,3,6,7,8-HxCDD	100	107		pg/g		107	73 - 147
1,2,3,7,8,9-HxCDD	100	119		pg/g		119	80 - 143
1,2,3,4,7,8-HxCDF	100	101		pg/g		101	72 - 140
1,2,3,6,7,8-HxCDF	100	97.7		pg/g		98	63 - 152
1,2,3,7,8,9-HxCDF	100	106		pg/g		106	72 - 152
2,3,4,6,7,8-HxCDF	100	99.9		pg/g		100	72 - 151
1,2,3,4,6,7,8-HpCDD	100	112		pg/g		112	86 - 134
1,2,3,4,6,7,8-HpCDF	100	105		pg/g		105	81 - 137
1,2,3,4,7,8,9-HpCDF	100	111		pg/g		111	79 - 139
OCDD	200	219		pg/g		109	80 - 137
OCDF	200	217		pg/g		108	75 - 141

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C-2,3,7,8-TCDD	70		40 - 135
13C-2,3,7,8-TCDF	59		40 - 135
13C-1,2,3,7,8-PeCDD	73		40 - 135
13C-1,2,3,7,8-PeCDF	67		40 - 135
13C-1,2,3,6,7,8-HxCDD	63		40 - 135
13C-1,2,3,4,7,8-HxCDF	64		40 - 135
13C-1,2,3,4,6,7,8-HpCDD	67		40 - 135
13C-1,2,3,4,6,7,8-HpCDF	63		40 - 135
13C-OCDD	61		40 - 135

Lab Sample ID: 320-55071-5 MS
Matrix: Solid
Analysis Batch: 331858

Client Sample ID: G-01-01
Prep Type: Total/NA
Prep Batch: 329327

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
2,3,7,8-TCDD	ND		29.5	28.5		pg/g	☼	97	77 - 130
2,3,7,8-TCDF	0.32	J	29.5	29.8		pg/g	☼	100	79 - 137

QC Sample Results

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: 320-55071-5 MS
Matrix: Solid
Analysis Batch: 331858

Client Sample ID: G-01-01
Prep Type: Total/NA
Prep Batch: 329327

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,7,8-PeCDD	1.4	J	147	159		pg/g	☼	107	79 - 134
1,2,3,7,8-PeCDF	0.34	J	147	149		pg/g	☼	101	81 - 134
2,3,4,7,8-PeCDF	ND		147	155		pg/g	☼	105	76 - 132
1,2,3,4,7,8-HxCDD	3.2	J B	147	174		pg/g	☼	115	65 - 144
1,2,3,6,7,8-HxCDD	7.6	J	147	165		pg/g	☼	107	73 - 147
1,2,3,7,8,9-HxCDD	7.2	J	147	178		pg/g	☼	116	80 - 143
1,2,3,4,7,8-HxCDF	0.90	J	147	146		pg/g	☼	98	72 - 140
1,2,3,6,7,8-HxCDF	0.62	J	147	135		pg/g	☼	91	63 - 152
1,2,3,7,8,9-HxCDF	0.43	J B	147	151		pg/g	☼	102	72 - 152
2,3,4,6,7,8-HxCDF	0.70	J B	147	141		pg/g	☼	95	72 - 151
1,2,3,4,6,7,8-HpCDD	210	B F1	147	430	F1	pg/g	☼	150	86 - 134
1,2,3,4,6,7,8-HpCDF	15	B	147	170		pg/g	☼	105	81 - 137
1,2,3,4,7,8,9-HpCDF	ND		147	180		pg/g	☼	122	79 - 139
OCDD	1700	B F2	295	2480	4	pg/g	☼	265	80 - 137
OCDF	30	B	295	353		pg/g	☼	110	75 - 141

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C-2,3,7,8-TCDD	*63*		*40 - 135*
13C-2,3,7,8-TCDF	*57*		*40 - 135*
13C-1,2,3,7,8-PeCDD	*65*		*40 - 135*
13C-1,2,3,7,8-PeCDF	*60*		*40 - 135*
13C-1,2,3,6,7,8-HxCDD	*51*		*40 - 135*
13C-1,2,3,4,7,8-HxCDF	*54*		*40 - 135*
13C-1,2,3,4,6,7,8-HpCDD	*58*		*40 - 135*
13C-1,2,3,4,6,7,8-HpCDF	*50*		*40 - 135*
13C-OCDD	*53*		*40 - 135*

Lab Sample ID: 320-55071-5 MSD
Matrix: Solid
Analysis Batch: 331858

Client Sample ID: G-01-01
Prep Type: Total/NA
Prep Batch: 329327

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,3,7,8-TCDD	ND		29.5	27.6		pg/g	☼	94	77 - 130	3	20
2,3,7,8-TCDF	0.32	J	29.5	30.0		pg/g	☼	101	79 - 137	1	20
1,2,3,7,8-PeCDD	1.4	J	147	161		pg/g	☼	108	79 - 134	1	20
1,2,3,7,8-PeCDF	0.34	J	147	149		pg/g	☼	101	81 - 134	0	20
2,3,4,7,8-PeCDF	ND		147	154		pg/g	☼	104	76 - 132	1	20
1,2,3,4,7,8-HxCDD	3.2	J B	147	172		pg/g	☼	115	65 - 144	1	20
1,2,3,6,7,8-HxCDD	7.6	J	147	164		pg/g	☼	106	73 - 147	1	20
1,2,3,7,8,9-HxCDD	7.2	J	147	180		pg/g	☼	117	80 - 143	1	20
1,2,3,4,7,8-HxCDF	0.90	J	147	147		pg/g	☼	99	72 - 140	1	20
1,2,3,6,7,8-HxCDF	0.62	J	147	139		pg/g	☼	94	63 - 152	3	20
1,2,3,7,8,9-HxCDF	0.43	J B	147	150		pg/g	☼	101	72 - 152	1	20
2,3,4,6,7,8-HxCDF	0.70	J B	147	139		pg/g	☼	94	72 - 151	2	20
1,2,3,4,6,7,8-HpCDD	210	B F1	147	367		pg/g	☼	107	86 - 134	16	20
1,2,3,4,6,7,8-HpCDF	15	B	147	162		pg/g	☼	100	81 - 137	5	20
1,2,3,4,7,8,9-HpCDF	ND		147	174		pg/g	☼	118	79 - 139	3	20
OCDD	1700	B F2	295	1910	4 F2	pg/g	☼	71	80 - 137	26	20
OCDF	30	B	295	339		pg/g	☼	105	75 - 141	4	20

QC Sample Results

Client: Weston Solutions, Inc. Job ID: 320-55071-1
Project/Site: START R9 - Guam Agent Orange

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C-2,3,7,8-TCDD	64		40 - 135
13C-2,3,7,8-TCDF	56		40 - 135
13C-1,2,3,7,8-PeCDD	69		40 - 135
13C-1,2,3,7,8-PeCDF	62		40 - 135
13C-1,2,3,6,7,8-HxCDD	55		40 - 135
13C-1,2,3,4,7,8-HxCDF	58		40 - 135
13C-1,2,3,4,6,7,8-HpCDD	63		40 - 135
13C-1,2,3,4,6,7,8-HpCDF	55		40 - 135
13C-OCDD	57		40 - 135

Method: D 2216 - Percent Moisture

Lab Sample ID: 480-160240-A-4 DU — **Client Sample ID: Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 330140

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	0.0		0.1		%		NC	20
Percent Solids	100.0		99.9		%		0.1	20

Lab Sample ID: 320-55004-E-17 DU — **Client Sample ID: Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 330305

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	13.1		13.3		%		2	20
Percent Solids	86.9		86.7		%		0.3	20

Lab Sample ID: 590-11994-A-6 DU — **Client Sample ID: Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 330691

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	4.6		4.9		%		6	20
Percent Solids	95.4		95.1		%		0.3	20

Lab Sample ID: 320-55123-A-6 DU — **Client Sample ID: Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 330898

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	10.2		12.7	F3	%		22	20
Percent Solids	89.8		87.3		%		3	20

QC Association Summary

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

LCMS

Prep Batch: 473626

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55071-1	G-04-02	Total/NA	Solid	Auto Shaker	
320-55071-2	G-04-01	Total/NA	Solid	Auto Shaker	
320-55071-3	G-04-02-D	Total/NA	Solid	Auto Shaker	
320-55071-4	G-01-01-D	Total/NA	Solid	Auto Shaker	
320-55071-5	G-01-01	Total/NA	Solid	Auto Shaker	
320-55071-6	G-03-01	Total/NA	Solid	Auto Shaker	
320-55071-7	G-03-02	Total/NA	Solid	Auto Shaker	
320-55071-8	G-02-03	Total/NA	Solid	Auto Shaker	
320-55071-9	G-02-02	Total/NA	Solid	Auto Shaker	
320-55071-10	G-02-01	Total/NA	Solid	Auto Shaker	
MB 280-473626/1-A	Method Blank	Total/NA	Solid	Auto Shaker	
LCS 280-473626/2-A	Lab Control Sample	Total/NA	Solid	Auto Shaker	
320-55071-5 MS	G-01-01	Total/NA	Solid	Auto Shaker	
320-55071-5 MSD	G-01-01	Total/NA	Solid	Auto Shaker	

Analysis Batch: 477353

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55071-1	G-04-02	Total/NA	Solid	8321A	473626
320-55071-2	G-04-01	Total/NA	Solid	8321A	473626
320-55071-3	G-04-02-D	Total/NA	Solid	8321A	473626
320-55071-4	G-01-01-D	Total/NA	Solid	8321A	473626
320-55071-5	G-01-01	Total/NA	Solid	8321A	473626
320-55071-6	G-03-01	Total/NA	Solid	8321A	473626
320-55071-7	G-03-02	Total/NA	Solid	8321A	473626
320-55071-8	G-02-03	Total/NA	Solid	8321A	473626
320-55071-9	G-02-02	Total/NA	Solid	8321A	473626
320-55071-10	G-02-01	Total/NA	Solid	8321A	473626
MB 280-473626/1-A	Method Blank	Total/NA	Solid	8321A	473626
LCS 280-473626/2-A	Lab Control Sample	Total/NA	Solid	8321A	473626
320-55071-5 MS	G-01-01	Total/NA	Solid	8321A	473626
320-55071-5 MSD	G-01-01	Total/NA	Solid	8321A	473626

Specialty Organics

Prep Batch: 329327

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55071-1	G-04-02	Total/NA	Solid	8290	
320-55071-2	G-04-01	Total/NA	Solid	8290	
320-55071-3	G-04-02-D	Total/NA	Solid	8290	
320-55071-4	G-01-01-D	Total/NA	Solid	8290	
320-55071-5	G-01-01	Total/NA	Solid	8290	
320-55071-6	G-03-01	Total/NA	Solid	8290	
320-55071-7	G-03-02	Total/NA	Solid	8290	
320-55071-7 - RA	G-03-02	Total/NA	Solid	8290	
320-55071-8	G-02-03	Total/NA	Solid	8290	
320-55071-9	G-02-02	Total/NA	Solid	8290	
320-55071-10	G-02-01	Total/NA	Solid	8290	
MB 320-329327/1-A	Method Blank	Total/NA	Solid	8290	
LCS 320-329327/2-A	Lab Control Sample	Total/NA	Solid	8290	
320-55071-5 MS	G-01-01	Total/NA	Solid	8290	
320-55071-5 MSD	G-01-01	Total/NA	Solid	8290	

QC Association Summary

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Specialty Organics

Analysis Batch: 331857

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55071-1	G-04-02	Total/NA	Solid	8290A	329327
320-55071-2	G-04-01	Total/NA	Solid	8290A	329327
MB 320-329327/1-A	Method Blank	Total/NA	Solid	8290A	329327
LCS 320-329327/2-A	Lab Control Sample	Total/NA	Solid	8290A	329327

Analysis Batch: 331858

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55071-4	G-01-01-D	Total/NA	Solid	8290A	329327
320-55071-5	G-01-01	Total/NA	Solid	8290A	329327
320-55071-6	G-03-01	Total/NA	Solid	8290A	329327
320-55071-7	G-03-02	Total/NA	Solid	8290A	329327
320-55071-8	G-02-03	Total/NA	Solid	8290A	329327
320-55071-9	G-02-02	Total/NA	Solid	8290A	329327
320-55071-10	G-02-01	Total/NA	Solid	8290A	329327
320-55071-5 MS	G-01-01	Total/NA	Solid	8290A	329327
320-55071-5 MSD	G-01-01	Total/NA	Solid	8290A	329327

Analysis Batch: 332162

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55071-7 - RA	G-03-02	Total/NA	Solid	8290A	329327

Analysis Batch: 332655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55071-3	G-04-02-D	Total/NA	Solid	8290A	329327

General Chemistry

Analysis Batch: 330140

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55071-4	G-01-01-D	Total/NA	Solid	D 2216	
320-55071-7	G-03-02	Total/NA	Solid	D 2216	
320-55071-8	G-02-03	Total/NA	Solid	D 2216	
320-55071-9	G-02-02	Total/NA	Solid	D 2216	
480-160240-A-4 DU	Duplicate	Total/NA	Solid	D 2216	

Analysis Batch: 330305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55071-5	G-01-01	Total/NA	Solid	D 2216	
320-55071-6	G-03-01	Total/NA	Solid	D 2216	
320-55004-E-17 DU	Duplicate	Total/NA	Solid	D 2216	

Analysis Batch: 330691

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55071-10	G-02-01	Total/NA	Solid	D 2216	
590-11994-A-6 DU	Duplicate	Total/NA	Solid	D 2216	

Analysis Batch: 330898

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55071-1	G-04-02	Total/NA	Solid	D 2216	
320-55071-2	G-04-01	Total/NA	Solid	D 2216	
320-55071-3	G-04-02-D	Total/NA	Solid	D 2216	

QC Association Summary

Client: Weston Solutions, Inc. Job ID: 320-55071-1
Project/Site: START R9 - Guam Agent Orange

General Chemistry (Continued)

Analysis Batch: 330898 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-55123-A-6 DU	Duplicate	Total/NA	Solid	D 2216	

Lab Chronicle

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-04-02
Date Collected: 10/04/19 11:20
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			330898	10/14/19 16:37	HRB	TAL SAC

Client Sample ID: G-04-02
Date Collected: 10/04/19 11:20
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-1
Matrix: Solid
Percent Solids: 76.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Auto Shaker			10.84 g	10 mL	473626	10/10/19 16:33	TEH	TAL DEN
Total/NA	Analysis	8321A		1			477353	11/12/19 04:41	CBB	TAL DEN
Total/NA	Prep	8290			9.86 g	20 uL	329327	10/08/19 14:09	FC	TAL SAC
Total/NA	Analysis	8290A		1			331857	10/17/19 22:55	AS	TAL SAC

Client Sample ID: G-04-01
Date Collected: 10/04/19 11:18
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			330898	10/14/19 16:37	HRB	TAL SAC

Client Sample ID: G-04-01
Date Collected: 10/04/19 11:18
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-2
Matrix: Solid
Percent Solids: 74.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Auto Shaker			10.47 g	10 mL	473626	10/10/19 16:33	TEH	TAL DEN
Total/NA	Analysis	8321A		1			477353	11/12/19 04:47	CBB	TAL DEN
Total/NA	Prep	8290			9.86 g	20 uL	329327	10/08/19 14:09	FC	TAL SAC
Total/NA	Analysis	8290A		1			331857	10/17/19 23:41	AS	TAL SAC

Client Sample ID: G-04-02-D
Date Collected: 10/04/19 11:35
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			330898	10/14/19 16:37	HRB	TAL SAC

Client Sample ID: G-04-02-D
Date Collected: 10/04/19 11:35
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-3
Matrix: Solid
Percent Solids: 74.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Auto Shaker			10.62 g	10 mL	473626	10/10/19 16:33	TEH	TAL DEN
Total/NA	Analysis	8321A		1			477353	11/12/19 04:53	CBB	TAL DEN
Total/NA	Prep	8290			9.85 g	20 uL	329327	10/08/19 14:09	FC	TAL SAC
Total/NA	Analysis	8290A		1			332655	10/21/19 22:24	ALM	TAL SAC

Lab Chronicle

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-01-01-D
Date Collected: 10/02/19 10:50
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			330140	10/10/19 17:32	HRB	TAL SAC

Client Sample ID: G-01-01-D
Date Collected: 10/02/19 10:50
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-4
Matrix: Solid
Percent Solids: 62.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Auto Shaker			10.54 g	10 mL	473626	10/10/19 16:33	TEH	TAL DEN
Total/NA	Analysis	8321A		1			477353	11/12/19 04:59	CBB	TAL DEN
Total/NA	Prep	8290			9.95 g	20 uL	329327	10/08/19 14:09	FC	TAL SAC
Total/NA	Analysis	8290A		1			331858	10/18/19 04:49	AS	TAL SAC

Client Sample ID: G-01-01
Date Collected: 10/02/19 10:05
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-5
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			330305	10/11/19 16:06	TCS	TAL SAC

Client Sample ID: G-01-01
Date Collected: 10/02/19 10:05
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-5
Matrix: Solid
Percent Solids: 65.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Auto Shaker			10.11 g	10 mL	473626	10/10/19 16:33	TEH	TAL DEN
Total/NA	Analysis	8321A		1			477353	11/12/19 05:05	CBB	TAL DEN
Total/NA	Prep	8290			9.95 g	20 uL	329327	10/08/19 14:09	FC	TAL SAC
Total/NA	Analysis	8290A		1			331858	10/18/19 05:35	AS	TAL SAC

Client Sample ID: G-03-01
Date Collected: 10/02/19 14:55
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-6
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			330305	10/11/19 16:06	TCS	TAL SAC

Client Sample ID: G-03-01
Date Collected: 10/02/19 14:55
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-6
Matrix: Solid
Percent Solids: 75.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Auto Shaker			10.99 g	10 mL	473626	10/10/19 16:33	TEH	TAL DEN
Total/NA	Analysis	8321A		1			477353	11/12/19 05:23	CBB	TAL DEN
Total/NA	Prep	8290			10.07 g	20 uL	329327	10/08/19 14:09	FC	TAL SAC
Total/NA	Analysis	8290A		1			331858	10/18/19 07:53	AS	TAL SAC

Lab Chronicle

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-03-02
Date Collected: 10/02/19 15:10
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-7
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			330140	10/10/19 17:32	HRB	TAL SAC

Client Sample ID: G-03-02
Date Collected: 10/02/19 15:10
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-7
Matrix: Solid
Percent Solids: 79.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Auto Shaker			10.3 g	10 mL	473626	10/10/19 16:33	TEH	TAL DEN
Total/NA	Analysis	8321A		1			477353	11/12/19 05:36	CBB	TAL DEN
Total/NA	Prep	8290			10.06 g	20 uL	329327	10/08/19 14:09	FC	TAL SAC
Total/NA	Analysis	8290A		1			331858	10/18/19 08:39	AS	TAL SAC
Total/NA	Prep	8290	RA		10.06 g	20 uL	329327	10/08/19 14:09	FC	TAL SAC
Total/NA	Analysis	8290A	RA	1			332162	10/18/19 18:49	KSS	TAL SAC

Client Sample ID: G-02-03
Date Collected: 10/02/19 11:29
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-8
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			330140	10/10/19 17:32	HRB	TAL SAC

Client Sample ID: G-02-03
Date Collected: 10/02/19 11:29
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-8
Matrix: Solid
Percent Solids: 62.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Auto Shaker			10.28 g	10 mL	473626	10/10/19 16:33	TEH	TAL DEN
Total/NA	Analysis	8321A		1	1 mL	1.0 mL	477353	11/12/19 05:42	CBB	TAL DEN
Total/NA	Prep	8290			9.87 g	20 uL	329327	10/08/19 14:09	FC	TAL SAC
Total/NA	Analysis	8290A		1			331858	10/18/19 09:25	AS	TAL SAC

Client Sample ID: G-02-02
Date Collected: 10/02/19 11:06
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-9
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			330140	10/10/19 17:32	HRB	TAL SAC

Client Sample ID: G-02-02
Date Collected: 10/02/19 11:06
Date Received: 10/07/19 09:05

Lab Sample ID: 320-55071-9
Matrix: Solid
Percent Solids: 78.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Auto Shaker			10.36 g	10 mL	473626	10/10/19 16:33	TEH	TAL DEN
Total/NA	Analysis	8321A		1			477353	11/12/19 05:48	CBB	TAL DEN

Lab Chronicle

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Client Sample ID: G-02-02

Lab Sample ID: 320-55071-9
Date Collected: 10/02/19 11:06
Matrix: Solid
Date Received: 10/07/19 09:05
Percent Solids: 78.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	8290			9.92 g	20 uL	329327	10/08/19 14:09	FC	TAL SAC
Total/NA	Analysis	8290A		1			331858	10/18/19 10:11	AS	TAL SAC

Client Sample ID: G-02-01

Lab Sample ID: 320-55071-10
Date Collected: 10/02/19 10:43
Matrix: Solid
Date Received: 10/07/19 09:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			330691	10/14/19 09:51	MC	TAL SAC

Client Sample ID: G-02-01

Lab Sample ID: 320-55071-10
Date Collected: 10/02/19 10:43
Matrix: Solid
Date Received: 10/07/19 09:05
Percent Solids: 70.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Auto Shaker			10.0 g	10 mL	473626	10/10/19 16:33	TEH	TAL DEN
Total/NA	Analysis	8321A		1			477353	11/12/19 05:54	CBB	TAL DEN
Total/NA	Prep	8290			10.28 g	20 uL	329327	10/08/19 14:09	FC	TAL SAC
Total/NA	Analysis	8290A		1			331858	10/18/19 10:57	AS	TAL SAC

Laboratory References:

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Weston Solutions, Inc. Job ID: 320-55071-1
Project/Site: START R9 - Guam Agent Orange

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-20
Arkansas DEQ	State	19-042-0	06-17-20
California	State	2897	01-31-20
Colorado	State	CA0004	08-31-20
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-20
Georgia	State	4040	01-29-20
Hawaii	State	<cert No.>	01-29-20
Illinois	NELAP	200060	03-17-20
Kansas	NELAP	E-10375	10-31-20 *
Louisiana	NELAP	01944	06-30-20
Maine	State	2018009	04-14-20
Michigan	State	9947	01-29-20
Michigan	State Program	9947	01-31-20
Nevada	State	CA000442020-1	07-31-20
New Hampshire	NELAP	2997	04-18-20
New Jersey	NELAP	CA005	06-30-20
New York	NELAP	11666	04-01-20
Oregon	NELAP	4040	01-29-20
Pennsylvania	NELAP	68-01272	03-31-20
Texas	NELAP	T104704399-19-13	05-31-20
US Fish & Wildlife	US Federal Programs	58448	07-31-20
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-29-20
Vermont	State	VT-4040	04-16-20
Virginia	NELAP	460278	03-14-20
Washington	State	C581	05-05-20
West Virginia (DW)	State	9930C	12-31-19
Wyoming	State Program	8TMS-L	01-28-19 *

Laboratory: Eurofins TestAmerica, Denver

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	4025	01-08-20

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Weston Solutions, Inc. Job ID: 320-55071-1
Project/Site: START R9 - Guam Agent Orange

Method	Method Description	Protocol	Laboratory
8321A	Herbicides (LC/MS)	SW846	TAL DEN
8290A	Dioxins and Furans (HRGC/HRMS)	SW846	TAL SAC
TEQ	Total TEQ Calculation	TAL SOP	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC
8290	Soxhlet Extraction of Dioxins and Furans	SW846	TAL SAC
Auto Shaker	Wrist Action Shaker Extraction Technique	None	TAL DEN

Protocol References:

ASTM = ASTM International
None = None
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Weston Solutions, Inc.
Project/Site: START R9 - Guam Agent Orange

Job ID: 320-55071-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-55071-1	G-04-02	Solid	10/04/19 11:20	10/07/19 09:05	
320-55071-2	G-04-01	Solid	10/04/19 11:18	10/07/19 09:05	
320-55071-3	G-04-02-D	Solid	10/04/19 11:35	10/07/19 09:05	
320-55071-4	G-01-01-D	Solid	10/02/19 10:50	10/07/19 09:05	
320-55071-5	G-01-01	Solid	10/02/19 10:05	10/07/19 09:05	
320-55071-6	G-03-01	Solid	10/02/19 14:55	10/07/19 09:05	
320-55071-7	G-03-02	Solid	10/02/19 15:10	10/07/19 09:05	
320-55071-8	G-02-03	Solid	10/02/19 11:29	10/07/19 09:05	
320-55071-9	G-02-02	Solid	10/02/19 11:06	10/07/19 09:05	
320-55071-10	G-02-01	Solid	10/02/19 10:43	10/07/19 09:05	

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Environmental Analysis Request/Chain of Custody

Acct. # — Group # — Sample # —

Client: Weston Solutions
Project Name/#: Guam Agent Orange — Site ID #:
Project Manager: Amanda Wagner — P.O. #: 0101633
Sampler: A. Wagner/ N. Lew — PWSID #:
Phone #: (702) 606-3489 — Quote #:
State where samples were collected: GU — For Compliance: Yes ☐ No ☐

Matrix: Soil ☒ Sediment ☐ Tissue ☐; Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐; Other:

Total # of Containers: 20

Analyses Requested / Preservation and Filtration Codes: 8321 Herbicides; 8290 Dioxin

For Lab Use Only
SF #:
SCR #:

Preservation Codes: H = HCl, T = Thiosulfate, N = HNO_3, B = NaOH, S = H_2SO_4, P = H_3PO_4, F = Field Filtered, O = Other

Sample Identification	Date	Time	Grab	Composite	Soil	Water	Other	Total # of Containers	8321 Herbicides	8290 Dioxin	Remarks
G-04-02	10/4/19	1120		X				2	X	X	
G-04-01	10/4/19	1118		X				2	X	X	
G-04-02-D	10/4/19	1135		X				2	X	X	
G-01-01-D	10/2/19	1050		X				2	X	X	
G-01-01 (MS/MSD)	10/2/19	1005		X				2	X	X	
G-03-01	10/2/19	1455		X				2	X	X	
G-03-02	10/2/19	1510		X				2	X	X	
G-02-03	10/2/19	1129		X				2	X	X	
G-02-02	10/2/19	1106		X				2	X	X	
G-02-01	10/2/19	1043		X				2	X	X	

320-55071 Chain of Custody

Turnaround Time Requested (TAT) (please check): Standard ☒ Rush ☐
(Rush TAT is subject to laboratory approval and surcharges.)
Date results are needed: Normal TAT
Rush results requested by (please check): E-Mail ☐ Phone ☐
E-mail Address:
Phone:

Data Package Options (please check if required)
Type I (Validation/non-CLP) ☐ MA MCP ☐
Type III (Reduced non-CLP) ☐ CT RCP ☐
Type VI (Raw Data Only) ☐ TX TRRP-13 ☐
NJ DKQP ☐ NYSDEC Category ☐ A or ☐ B
EDD Required? Yes ☒ No ☐ If yes, format: will provide template via email

Relinquished by:	Date	Time	Received by:	Date	Time
Amanda Wagner [signature]	10/4/19	0950	[signature] Aetusac	10/7/19	705
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time

Relinquished by Commercial Carrier: UPS ____ FedEx ____ Other ____
Temperature upon receipt 3.8 °C

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 — 7045 0717

Login Sample Receipt Checklist

Client: Weston Solutions, Inc. Job Number: 320-55071-1

Login Number: 55071 **List Source: Eurofins TestAmerica, Sacramento**
List Number: 1
Creator: Onishi, Marc

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	1066317, 1066316
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	False	Refer to Job Narrative for details.
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Weston Solutions, Inc. Job Number: 320-55071-1

Login Number: 55071
List Number: 2
Creator: Bunzli, Eric K

List Source: Eurofins TestAmerica, Denver
List Creation: 10/09/19 01:04 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	False	Seals on cooler but date and time not filled out.
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Exhibit B

R. Kyle Ardoin
SECRETARY OF STATE

State of Louisiana
Secretary of State

COMMERCIAL DIVISION
225.925.4704

Administrative Services
225.932.5317 Fax
Corporations
225.932.5314 Fax
Uniform Commercial Code
225.932.5318 Fax

02/10/2020

ONLINE FILING
JOHNLAWESQ@MSN.COM

MILITARY-VETERANS ADVOCACY, INC.

It has been a pleasure to approve and place on file your Restated Articles. The appropriate evidence is attached for your files.

Payment of the filing fee is acknowledged by this letter.

In addition to email and text notifications, business owners now have the option to enroll in our secured business filings (SBF) service. This service is available online, at no charge, by filing a notarized affidavit. Upon enrollment, an amendment cannot be made to your entity without approval using your personal identification number. This is another way to protect your business from fraud and identity theft.

Please note that as of January 1, 2018, business owners in the following parishes will be required to file all available business documents online through geauxBIZ: Ascension, Bossier, Caddo, Calcasieu, East Baton Rouge, Jefferson, Lafayette, Livingston, Orleans, Ouachita, Rapides, St. Tammany, Tangipahoa and Terrebonne.

Online filing options are available if changes are necessary to your registration or if you need to file an annual report. Please visit our website at **GeauxBiz.com** for your future business needs.

Sincerely,

The Commercial Division
AP

UNITED STATES OF AMERICA

State of Louisiana

R. Kyle Ardoin

SECRETARY OF STATE

As Secretary of State of the State of Louisiana, I do hereby Certify that

a copy of Restated Articles of Incorporation of

MILITARY-VETERANS ADVOCACY, INC.

Domiciled at SLIDELL, LOUISIANA,

Was filed and recorded in this Office on February 09, 2020.

In testimony whereof, I have hereunto set my hand and caused the Seal of my Office to be affixed at the City of Baton Rouge on,

February 10, 2020

Secretary of State

AP 40996337N

Certificate ID: 11167622#4CF52

To validate this certificate, visit the following web site, go to **Business Services**, **Search for Louisiana Business Filings**, **Validate a Certificate**, then follow the instructions displayed.
www.sos.la.gov

UNITED STATES OF AMERICA

State of Louisiana

R. Kyle Ardoin

SECRETARY OF STATE

As Secretary of State of the State of Louisiana, I do hereby Certify that

the attached document(s) of

MILITARY-VETERANS ADVOCACY, INC.

are true and correct and are filed in the Louisiana Secretary of State's Office.

43774237 RESTA 02/09/2020 5 pages

In testimony whereof, I have hereunto set my hand and caused the Seal of my Office to be affixed at the City of Baton Rouge on,

February 10, 2020

Secretary of State

AP 40996337N

STATE OF LOUISIANA · UNION · JUSTICE · CONFIDENCE · SECRETARY OF STATE

Certificate ID: 11167623#CFG62

To validate this certificate, visit the following web site, go to Business Services, Search for Louisiana Business Filings, Validate a Certificate, then follow the instructions displayed.

www.sos.la.gov

STATE OF LOUISIANA PARISH ST. TAMMANY

RESTATED ARTICLES OF INCORPORATION
OF
Military-Veterans Advocacy, Inc.
A Louisiana Non-Profit Corporation

Article One

The name of this corporation is Military-Veterans Advocacy, Inc. This restatement accurately copies the articles and all amendments thereto in effect at the date of the restatement, without substantive change except as made by any new amendment or amendments contained in the restatement.. Each amendment has been effected in conformity with law. The corporation was formed and incorporated on December 6, 2012.

Article Two

The organization is organized exclusively for charitable, religious, educational, or scientific purposes under section 501(c)(3) of the Internal Revenue Code, or corresponding section of any future federal tax code. Specifically the organization will provide legal services, education and defense to members of the armed forces, counseling, education and assistance to veterans in obtaining veterans benefits and advocating for legislation on the federal, state and local level to benefit veterans. The organization will defend the religious rights of members of the armed forces. The corporation may, for such purposes, make distributions to organizations that qualify as exempt organizations under section 501(c)(3) of the United States Internal Revenue Code (as may be amended).

Article Three

The corporation shall enjoy perpetual corporate existence unless sooner dissolved in accordance with law.

Article Four

This corporation is a non-profit corporation. No part of the net earnings of the corporation shall inure to the benefit of, or be distributable to its members, directors, officers, or other private persons. The corporation shall, however, be authorized and empowered to pay the employees and contractors reasonable compensation for services rendered and to make payments and distributions in furtherance of the purposes set forth in Article Two. The corporation shall also be authorized to reimburse directors only for actual expenses incurred while fulfilling duties as a member of the board of directors. No part of the activities of the corporation shall be on behalf of any candidate for public office. Notwithstanding any other provision of these Articles, the corporation shall not carry on any other activities not permitted to be carried on: (a) by a corporation exempt from Federal Income Tax under Section 501(c)(3) of the United States Internal Revenue Code (as may be amended) or (b) by a corporation, contributions to which are deductible under Section 170 of the United States Internal Revenue Code (as may be amended).

Article Five

Upon the dissolution of this organization, assets shall be distributed for one or more exempt purposes within the meaning of section 501(c)(3) of the Internal Revenue Code, or corresponding section of any future federal tax code, or shall be distributed to the federal government or to a state or local government for a public purpose.

Article Six

The location and municipal address of this corporations registered office is:

Military-Veterans Advocacy, Inc.
769 Robert Blvd., Suite 201D
Slidell, LA 70458

Article Seven

The full name and municipal address of this corporation's registered agent is:

John B. Wells
769 Robert Blvd., Suite 201D
Slidell, LA 70458

Article Eight

The full name and address of the incorporator is:

John B. Wells
769 Robert Blvd., Suite 201D
Slidell, LA 70458

Article Nine

The corporation shall be governed by the Management Council that shall consist of not less than seven and not more than twenty members.

The Management Council is required to stand for election by ballot that shall be distributed to all members. A thirty day nomination period shall precede the distribution of the ballots in which any member may nominate themselves or any other member for the Management Council The results of the election shall be announced at an annual meeting of the members that shall be scheduled by them. The meeting may be held electronically and notices will be sent to all members by the Management Council with the ballots. Additionally, the Management Council shall distribute with the ballots a brief biography/platform (not to exceed 300 words) of all candidates. The Board of Advisors, by adoption of bylaws, may provide for procedures of subsequent elections fo the Management Council that are not inconsistent with

these Articles. (Revised November 2019).

Article Ten

The corporation is organized on a non-stock basis. The corporation shall have one class of members. Any natural person over the age of 18 may become a member of the corporation. Each member shall have one vote. Honorably discharged veterans will receive an additional vote and those members awarded the Purple Heart or Medal of Honor shall have three votes and all members shall have equal rights and privileges. Cumulative voting and proxy voting within the scope of R.S. 12:232C is not allowed. The Management Council may require membership dues and prescribe other provisions for maintaining membership status. Pursuant to La. R.S. 12:217 (2000). All members of the Management Council and Board of Directors and any Director shall be deemed members of the corporation. (November 2019).

Article Eleven

The corporation shall also establish a Board of Directors that shall be appointed by the Management Council. The Board of Directors shall serve for a period of two years and may be reappointed by the Management Council. The duties of the Board of Directors are to monitor and advise the Management Council, to represent the corporation and to raise money for the operation of the corporation. (Revised November 2019).

Article Twelve

The Management Council may from time to time establish certain specialized Sections to promote the goals of Military-Veterans Advocacy. Initially, two Sections are established: The Blue Water Navy and Agent Orange Survivors of Guam. Sections shall have the status of Committees under Louisiana law and shall maintain their own organizational structure subject to approval by the Management Council. Sections may from time to time hold meetings, keeping minutes to be forwarded to the Management Council. Sections may also maintain their own social media outreach programs, keeping the Management Council informed. All funding, media relations, legislative activities and litigation shall be maintained by the corporation. The corporation shall approve all expenditures. (Revised November 2019).

Article Thirteen

The power of indemnification under the Louisiana Revised Statues shall not be denied or limited by the bylaws.

Article Fourteen

The incorporators, officers and Advisors of this corporation claim the benefits of the limitation of liability of the provisions of the Louisiana Revised Statutes (as may be amended) to the fullest extent permitted by law as fully and completely as though said provisions were recited herein in full.

Article Fifteen

The corporation's federal tax identification number is72-3890520.

Article Sixteen

Whenever by any provision of law, the articles or the by-laws, the affirmative vote of the Management Council is required to authorize or constitute corporate action, the consent in writing to such corporate action signed by all of the members of the Management Council, having voting power on the particular question, shall be sufficient for the purpose, without necessity for a meeting of the Management Council. This consent, together with a certificate by the secretary of the corporation to the effect that the subscribers to the consent constitute all of the members of the Management Council entitled to vote on the particular question, shall be filed with the records of proceedings of the Management Council. (Revised November 2019).

Article Seventeen

The Annual Meeting of members shall be held during the month of November each year. The Management Council is authorized to devise a method where members can participate electronically by telephone or webcast. The Management Council shall cause written notice of the time, place and purpose of the meeting to be given to all members entitled to vote at such meeting, at least twenty-one days and not more than thirty days prior to the day fixed for the meeting. Notice of the annual meeting need not state the purpose thereof, except as otherwise provided in this Chapter if a specified action is to be taken at the meeting. If such written notice is placed in the United States mail, postage prepaid, and addressed to a member at his or her last known address, or sent electronically to the member's last known electronic mail address, notice shall be deemed to have been given him or her. Notice of any meeting may be waived in writing by any member at any time; the written waiver need not specify the purpose of or the business to be transacted at the meeting; and such notice shall be deemed to have been given to, or waived by, all members present or represented at any such meeting except any member who, at the beginning of the meeting, objects to the transaction of any business because the meeting is not lawfully called or convened. A quorum for the meeting of members is a majority of the Management Council. Subsequent to his death or resignation the quorum shall be twenty members in good standing. For the purpose of determining members entitled to notice of, and to vote at, a meeting of the members, all members in good standing as of the adjournment of the October board meeting shall receive notice and be entitled to vote at the annual meeting of members. For special meetings of the members, all members in good standing as of the close of business of the day before the notice is transmitted shall receive notice and be entitled to vote at the annual meeting of members. (Revised November 2019).

Article Eighteen

An amendment altering the articles may be adopted by two-thirds of the voting members present, at any annual or special meeting of members the notice of which set forth the proposed amendment or a summary of the changes to be made thereby. A quorum must be present at the

meeting at which the amendment to the articles is to be considered. The notice of such meeting must be transmitted to the members pursuant to Article Seventeen of these Articles. (Revised November 2019).

Signed: _____ February 9, 2020
John B. Wells Date
Chairman of the Board
and Treasurer

Sworn to and subscribed before me, Notary Public, this 9th day of February, 2020.

_____
Janice C. Wells
Notary Public #54928

CERTIFICATE OF COMPLIANCE

The brief complies with the type-volume limitation of Fed. Cir. R. 32(b)(1) because this brief contains 12,699 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(f) and Fed. Cir. R. 32(b)(2).

This brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type style requirements of Fed. R. App. P. 32(a)(6) because this brief has been prepared in a proportionally spaced typeface using Microsoft Word 2016 in Century Schoolbook 14-point font.

ORRICK, HERRINGTON & SUTCLIFFE LLP

/s/ James Anglin Flynn
James Anglin Flynn
Counsel for Petitioner