

**Washington Closure Hanford's Road Map to Closure
River Corridor Contract, Richland, Washington - 11450**

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ABSTRACT

Significant progress has been made on Hanford's 569,797,384.2 m² (220-mi²) Columbia River shore cleanup in the last decade but some of the most complex cleanup challenges lie ahead. In April 2005, U.S. Department of Energy (DOE) awarded the Hanford River Corridor Closure Contract (RCCC) to Washington Closure Hanford (WCH), a limited liability company owned by United Research Services, Bechtel National, and CH2M HILL. The contract is a cost plus incentive fee type with a 2015, no-extension end-point.

Since the inception of the RCCC, there have been significant changes to the project scope and schedule. Changes in release of facilities are requiring scope reductions and the introduction of the *American Recovery and Reinvestment Act 2009* (ARRA) has added new scope to the contract. In 2008, a plan, called the 2015 Vision, was introduced to accelerate the Hanford mission and accelerate reduction of the active cleanup footprint, providing protection of human health, the environment, and the Columbia River. To support the plan WCH introduced a sequential strategy for an orchestrated turnover of areas within the RCCC.

WCH and DOE, Richland Operations Office (RL) have initiated a teaming approach to proactively manage the significant challenges associated with the RCCC and assure a successful completion of the scope. WCH has successfully completed over 60% of the RCCC scope and overcome significant technical challenges. WCH has formed a team to develop and manage a closure strategy to assure successful completion and closure of the RCCC scope.

This process has produced significant success. RL and WCH have proactively resolved potential issues with contract closeout and facilitated accelerated active footprint reduction. WCH has completed evaluation and cleanup work for significant accelerated cleanup footprint reduction. Completion paperwork is now being processed to reduce the Hanford River Corridor active cleanup footprint by 155,399,286.6 m² (60 mi²)

PREFACE

RL and the major contractors are committed to continue progress in aggressively cleaning up the Hanford Site. The goals of this cleanup are to ensure the Columbia River is protected, groundwater is cleaned up to the highest practical standards, and Hanford's final contiguous active footprint is shrunk to the smallest practical size.

This cleanup defines two main geographical areas of cleanup: the River Corridor and Central Plateau. The River Corridor includes the former fuel fabrication and reactor operation areas adjacent to the Columbia River with cleanup focusing on reducing risk to that valuable resource. The Central Plateau includes the former fuel processing facilities and numerous waste disposal facilities. Included within the Central Plateau area is Hanford's most significant challenge, the Tank Waste cleanup. Each of these

components of cleanup is in itself a complex and challenging task requiring many years and billions of dollars to complete. As work progresses in achieving these goals, RL and site contractors team together to accomplish cleanup in a manner that protects site workers, the public, and the environment and is regulatory compliant.

INTRODUCTION

The River Corridor cleanup has been one of Hanford's top priorities since the early 1990s. This urgency is due to the proximity of hundreds of waste sites to the Columbia River and the groundwater that continues to threaten the Columbia River. Significant progress has been made on Hanford River Corridor cleanup in the last decade. However, huge cleanup challenges lie ahead.

In April 2005, RL awarded the Hanford River Corridor Closure Contract to WCH, a limited liability company owned by United Research Services, Bechtel National, and CH2M HILL. It is a single-purpose company whose goal is to safely, compliantly, and efficiently accelerate cleanup in the 569,797,384.2 m² (220-mi²) Hanford River Corridor and reduce or eliminate future obligations to DOE for maintaining long-term stewardship over the site.

The RCCC is a 10-year (2005-2015) cost plus-incentive-fee closure contract. Cost incentives provide for an 80/20 cost savings split. For every dollar saved over the target cost, RL keeps 80 cents and WCH will earn 20 cents. Fee is contingent on completing all scope safely and efficiently by the end of the contract. A Conditional Payment of Fee clause allows for fee reduction for environmental, safety, and health performance failures.

WCH is responsible for performing work scope up to 15% above original estimates to meet cleanup requirements and incentivized to work safely and efficiently using savings to accelerate other scope. RL is responsible for changing the contract to recognize scope exceeding the 15% above original estimates and for providing the annual funding agreed to in the contract.

Work Scope and Organization

The River Corridor comprises about 569,797,384.2 m² (220 mi²) of land and is adjacent to the Columbia River (Figure 1). The RCCC is unique for being the only closure contract at Hanford and many times larger than any other completed closure contract across the DOE complex.

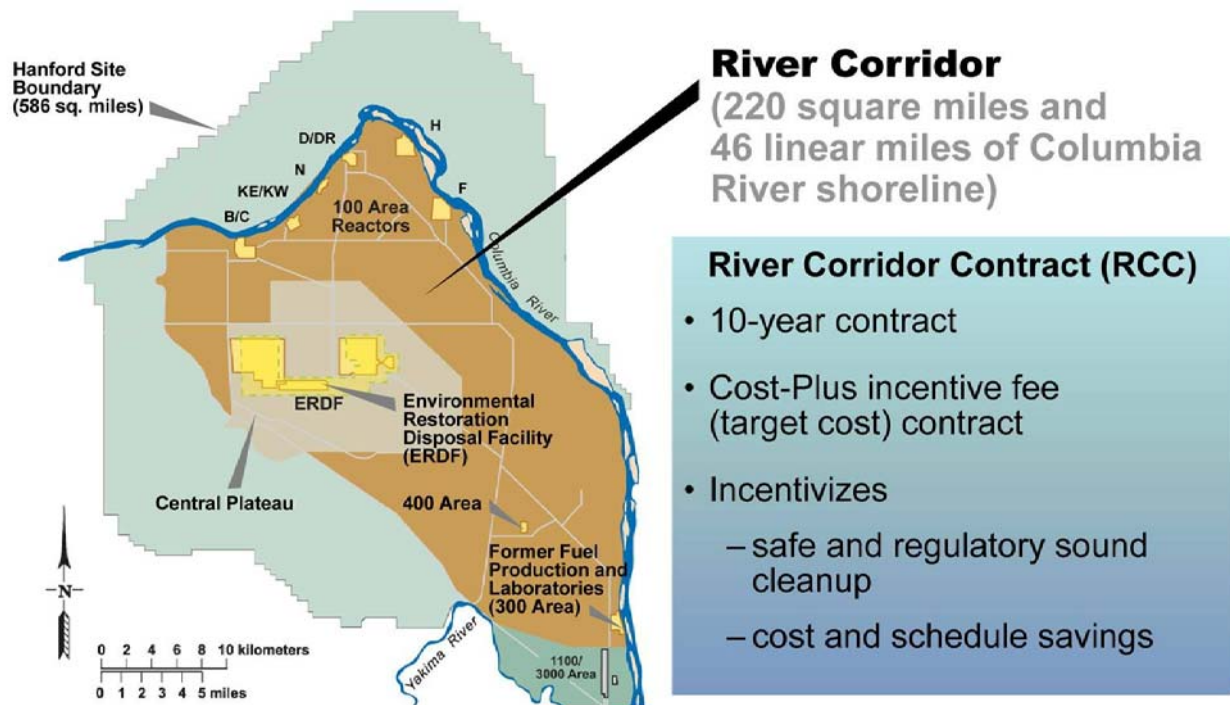


Figure 1. Map showing 220 mi² of the River Corridor Closure Contract.

WCH's work scope is summarized under the following six main groupings. WCH has organized itself accordingly to deliver the RCCC.

- Deactivate, Decontaminate, Decommission, and Demolish (D4) Buildings and Structures – This project performs all work by which facilities (buildings and structures) in the RCCC are removed from service; decontaminated, if required; and demolished with the debris removed and placed in the Environmental Restoration Disposal Facility (ERDF) or the Central Waste Complex (CWC), if required.
- Interim Safe Storage (ISS) – This project is organizationally combined with D4 and comprises the placement of former plutonium production reactors into safe storage by completing D4 up to the reactor shield wall and removing associated above and underground structures and other systems outside the reactor shield wall. ISS includes the construction of a safe storage enclosure (cocoon) around the reactor core to provide environmental enclosure. All debris is treated in a similar manner as described above in D4.
- Field Remediation (FR) – This project performs all work to remediate identified hazardous waste sites. The RCCC identifies all known waste sites that require remediation and additional sites are identified and added to the contract by a process known as Orphan Site Evaluation (OSE). Activities include the excavation of hazardous material and soils, and the treatment and disposal of these materials at ERDF or CWC.
- Waste Operations (WO) – This project manages all operations that transport and dispose of waste, generated by the above three facilities, at the ERDF complex. ERDF is a centralized *Comprehensive*

Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) disposal facility located on the Hanford plateau in the 200 Area. It is the main disposal facility for waste materials generated at Hanford from RCCC and other Hanford contractor waste remediation activities. WO includes the transport of waste materials from RCCC activities; treatment of waste materials, if required; and disposal of waste.

- Mission Completion (End State and Final Closure) – This project is organizationally within Environmental Protection (EP) and is chartered to provide a determination that no further action is needed to protect human health and the environment, obtain a proposed “finding of suitability,” and transfer the river corridor to long-term stewardship. Within this project, work scope includes preparing characterization plans and closure documents for remediated sites and facilities in support of the FR and D4/ISS field projects.
- Mission Support/General Support (MS/GS) – WCH uses a matrix-type organization to execute the RCCC scope of work. In this structure, the field projects are responsible for the delivery and quality of RCCC end-point, while the functional support and business operations necessary to achieve RCCC objectives are provided within the MS/GS “project.” MS/GS consists of the functional organizations: Environmental Protection; Safety, Health and Quality (SH&Q); Project Integration (PI); Project Services (PS); and Engineering Services, as well as Legal, Communications, Office of the President, and Employee Concerns Departments. MS/GS provides trained and qualified staff, performance standards, facilities services, and office supplies as well as other typical overhead (e.g., payroll, contracts, communications and public affairs, legal, employee recruitment, and staffing).

Changes To Workslope

By the beginning of 2010 the following significant changes had impacted the RCCC.

1. U.S. Department of Energy RL awarded a Plateau Remediation Contract (PRC) in 2008 and transferred a significant amount of RCCC scope to the new PRC contractor. These scope reductions are called deducts and are typified by the transfer of scope in the 100-K Area.
2. Clean-up work in the 300 Area was changed to accommodate new withdrawal schedules by the incumbent (Pacific Northwest National Laboratory). A relatively simple remediation strategy became complicated by the need to selectively work within facilities and utilities that were still occupied and required.
3. RL devised a new Hanford clean-up schedule across the site that became known as the 2015 Vision (Figure 2). This new plan required that key areas across the site were sequentially closed beginning in 2010. The RCCC allowed closure of all of the Hanford River Corridor simultaneously at the end of the project in 2015. In order to meet this new 2015 Vision, WCH would have to change its whole approach to closure.
4. In 2009, the U.S. government introduced the ARRA with aims to stimulate the economy. The WCH project was allotted an additional \$238M to accelerate the mission over a 2-year period between 2009 and 2011.
5. The RCCC requires WCH to perform an OSE process to review land parcels and identify potential waste sites in the River Corridor that are not currently listed in the existing Interim Action Records of Decision (IARODS). Newly found potential waste sites are then added to the contract through a Request for Equitable Adjustment (REA) process.

- Delays and uncertainty in the start of clean-up work on the 618-10/11 project have significantly raised the risk of not fully completing all of the burial grounds, vertical pipe units, and caissons by the end of 2015. The use of ARRA funding to accelerate characterization and burial ground cleanup will reduce this risk; however, the full extent of the work scope has not yet been fully confirmed.



Figure 2. The 2015 Vision.

Progress to Date

Since the beginning of the contract, significant work progress has been achieved. The RCC project is ahead of schedule, under budget, and is over 60% complete with the baseline work scope. Work is being performed safely, maintaining an excellent safety record while achieving an average of \$1.18 worth of cleanup for every \$1.00 spent.

To date, more than 42% of the facilities have been demolished, approximately 40% of the waste sites have been remediated, one of the two reactors have been placed in ISS with the second over 50% complete, and over 5.0 million tons of waste has been disposed.

Additionally, over 80% of the 569,797,384.2 m² (220 mi²) of the RCC has been evaluated using the OSE systematic approach to review the land and identify potentially new waste sites and miscellaneous restoration debris. This evaluation supports the elements of meeting the federal facility and land transfer requirements. This process consists of:

- Performing extensive and comprehensive historical reviews
- Analyzing the data from the Orthophotography and Light Detection and Ranging (LiDAR) flight surveys
- Physical walkdowns for field verification of questionable items identified during flight survey data analysis
- Physical walkdowns for all areas along the river
- Conducting road surveys for all accessible areas
- Conducting geophysics as needed.

The ARRA work scope has allowed for accelerating remediation and disposal. Work scope included characterization and remediation of newly discovered waste sites, upgrading ERDF, characterizing two Hazard Category 3 nuclear waste sites (618-10 and 618-11), and initiating trench remediation in the 618-10 waste site. Currently, the ARRA work scope is more than 65% complete and well on track to be completed by 2011.

Purpose and Objectives

In view of these changes and recognizing that the RCCC was a first-of-a-kind closure contract at Hanford, WCH has implemented an initiative to assure mutually successful contract completion. With the contract over half-way to completion, the company formed the Commitment to Closure Team (The Team) to develop its closure strategy to fully implement the contract and meet DOE's long term needs and five key objectives:

1. Complete all required regulatory documentation.
2. Manage resources to ensure the strategic retention of people and resources.

3. Support DOE's footprint reduction goals per the 2015 Vision.
4. Develop packages for all land segments completed to document that the area has been completely evaluated to detect waste sites, all waste sites have been cleaned up, and that the cleanup has been accepted by the regulators.
5. Develop and implement a turnover process for transfer of cleaned-up land segments from the cleanup contractor to the maintenance contractor.

EVALUATION PROCESS

In order to develop a strategy for closure that would apply to the entire project, The Team undertook a comprehensive evaluation of the WCH project. The evaluation began by looking at field work and then addressing the functional organizations that support field work and manage the business with the subsequent outcomes to establish a basis for the strategy.

The evaluation was done in the following two parts:

- Closure of the field work
- Closure of the business, meaning the functions that support the field work.

The Team developed a field work closure process to perform an area-by-area analysis of all field work by checking contract scope against the following:

- Contract requirements and deliverables
- Regulatory requirements
- Tri-Party milestones tied to the contract scope
- 2015 Vision schedule, basis, and assumptions.

Areas were analyzed in the sequence required by the 2015 Vision and expert personnel from all areas were invited to participate in some of the more complex areas such as 300 Area and 100-N Area. The Team conducted this evaluation alongside the company's Fiscal Year (FY) 2010 Contractor Performance Plan and the 2015 Vision.

The closure of the business (the functional organizations) is not directly related to completion of the field work but should also be executed incrementally. It was also recognized that closure pathways would differ from one organization to the next.

A business closure process was developed for use in assessing how individual businesses would close down by analyzing their requirements, processes, and process customers (users). An example was to consider the impact of processes closing immediately. The organizations were asked to assess their processes and service deliverables to determine how best they could complete, stop, or reduce them within the contract requirements framework. Because of the diverse nature of each functional organization and its business, their closure plans will be different. Also different will be the impact of field closure for each group.

CLOSURE STRATEGY

The evaluation concluded that it was possible to meet all contract requirements, including regulatory milestones, and also support the aims of the 2015 Vision. The RL objective of footprint reduction is now a key feature of the WCH closure strategy (Figure 3), which plans to deliver the RCCC by an incremental closure approach instead of a single one-time event at the end of the contract. The incremental or area-by-area approach, complimenting the 2015 Vision, has the River Corridor divided into 13 areas (Table 1) and the work scope broken down accordingly. This approach has advantages for all parties. It supports the 2015 Vision objectives of footprint reduction while providing WCH and RL with lessons-learned opportunities to exercise closure. This approach has flexibility to accommodate the potential changes to area closure dates. Each area closure will streamline final closure by the progressive divestment of work scope. This approach has largely been adopted by the projects but more work will be required to ensure the participation of the more complex projects, where major near-term issues make it difficult to focus on closure.

Table 1. Area and Square Miles.

Area	Vision 2015 Year	Square Miles
Segment 1	2010	28
Segment 2	2011	32
F Area	2012	2
Segment 3	2012	38
K Area	2012	3
Segment 4	2013	32
N Area	2013	3
Segment 5 and 400 Area	2014	55
D/H Area	2014	8
IU 2	2014	3
IU 6	2014	10
300 Area	2014	2
B/C	2014	4
Total	-	220

AREA CLOSURE

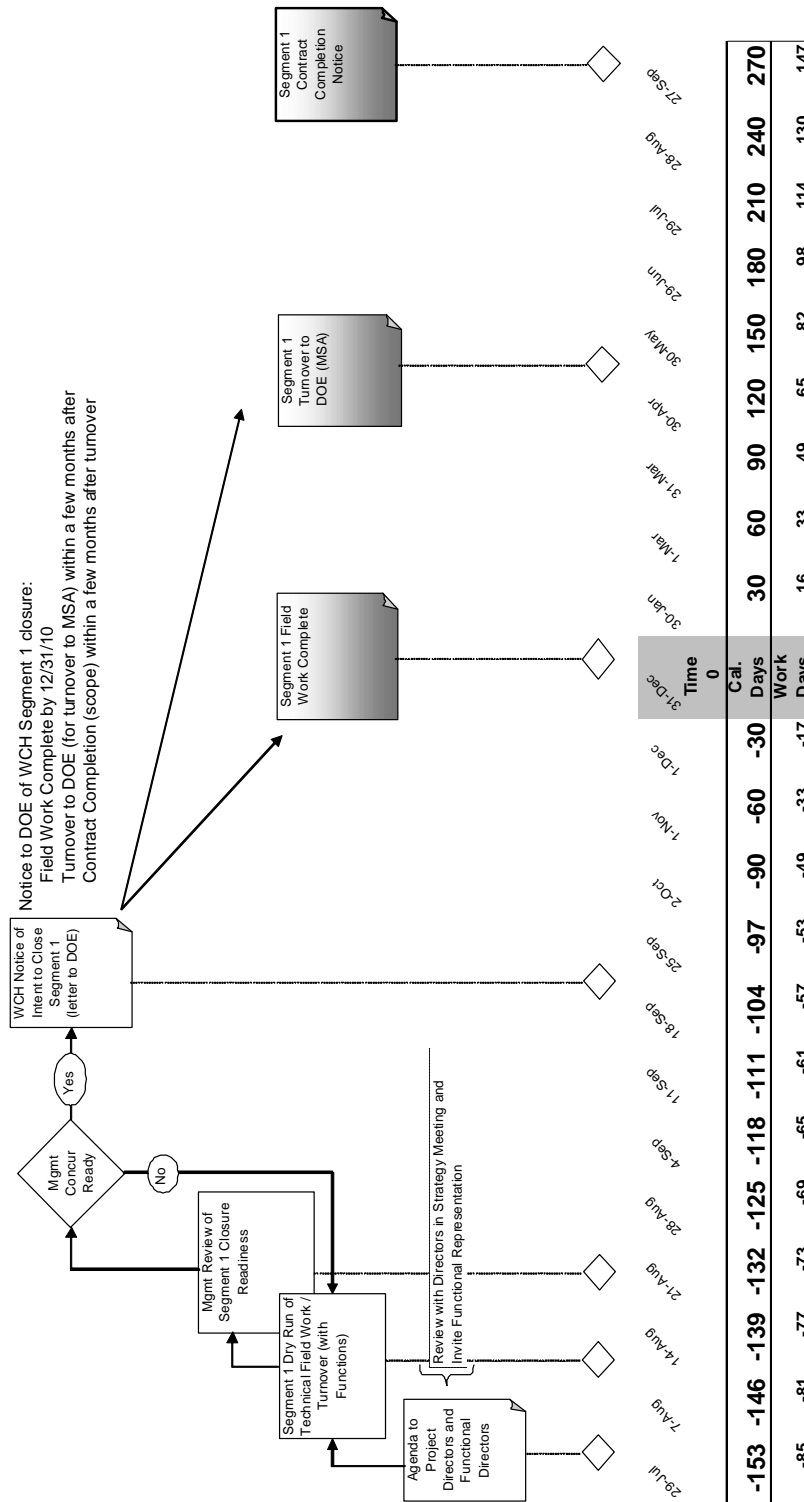
The concept of incremental closure is not limited to work completion. It applies equally to the functions that support the project. However, in the latter case, reduction will require a self-discipline that will not have the advantage of being triggered by field work closure. Incremental area closure may not directly impact all functional groups, but all business groups should use these closures to reduce in size and complexity as the footprint reduces. The following section provides more detail of incremental closure and how it applies, not just to the field but to the whole of the WCH organization.

Each area will be closed in three phases. As an example, the closure of Segment 1 is shown in Figure 4 along with the process that leads up to it.

Figure 4 shows the following three phases that will apply to each area.

Phase 1, Field Work Complete. Remediation of all waste sites (i.e., excavation, loadout, waste site reclassification form acceptance by regulators, backfill, and revegetation) and all Miscellaneous Restoration items removed and disposed, recontoured, and revegetated as necessary.

Field work complete may be different than “footprint reduction” complete. The work scope encompassed in achieving footprint reduction goals is currently an informally agreed-upon scope. For example, the Segment 2 footprint reduction definition is consistent with the definition of field work complete. However, F Area footprint reduction is different for DOE-Headquarters (DOE-HQ) and RL. The DOE-HQ footprint reduction definition is that all ARRA scope is completed, but the RL definition is all ARRA scope and MR loadout completed. Both of these definitions exclude the acceptance of the waste site reclassification forms, backfill, and revegetation.



Phase 2, Turnover to RL (Mission Support Alliance [MSA]). A Turnover Package documents that a geographical area within the RCCC has met the requirements of the final RCCC Long-Term Stewardship Plan in accordance with the RCCC Section C2.11. The information will provide a proposed finding of suitability to transfer in accordance with CERCLA Section 120(h). Multiple turnover packages will be developed to align with RL's approach of transitioning geographical areas of land within the River Corridor to support the 2015 Vision in a step-wise fashion cumulating in the eventual transfer of the approximately 569,797,384.2 m² (220 mi²).

Phase 3, Area Contract Completion Notice. This is the third phase of area closure and may result in contract modifications or negotiations with RL. In principle, completion of this phase will entail notification to RL that WCH has completed the scope associated with the area with a request to transfer the area back to RL or its designated agent and remove WCH's responsibility from the contract.

The figure 4 also shows the approval process of completion and subsequent notification to RL that lays the groundwork for turning over the property to MSA, contract modification, and relieving WCH of contractual liability for the area.

The complete process contains the following six stages and begins months before all field work is scheduled to be complete.

Stage 1, Technical Dry Run. WCH conducts a technical dry run of closure with the responsible project and functional managers. This identifies challenges and mitigating actions to ensure completion dates are achievable.

Stage 2, WCH Senior Management Review. The technical dry run is followed by a senior management review of readiness, risks, challenges, and plans for success. Following management concurrence, a notice of intent letter is issued to RL.

Stage 3, Notice of Intent Letter. The notice of intent letter provides RL with a schedule of three completion dates: 1) field work complete, 2) issue of turnover package, and 3) issue of area contract completion letter.

Stage 4, Field Work Complete Letter. Approximately two weeks after the field work is completed and verified, WCH will send a "Field Work Complete" letter to RL.

Stage 5, Turnover Package. About five months after completion of the field work, an integrated turnover package will be sent to RL by MSA. At the point when WCH sends the turnover package information to MSA for incorporation into the integrated turnover package, a formal letter will be sent to RL announcing completion of the turnover package, meeting a contract deliverable.

Stage 6, Area Contract Completion Letter. Approximately 6 months after the turnover package is submitted to MSA for inclusion in their integrated turnover package, WCH functions will identify and complete any remaining area-specific scope (e.g., document/drawing turnover, personnel reassignment, property transfers, and work order closeout). A due diligence or functional reconciliation will be completed. Any related scope that cannot be closed because it is not limited to the area being closed will be identified for closure during the post-contract closeout phase of the total RCCC. When all the related work is either closed or determined to be post-contract closeout scope, WCH will send a final area contract completion letter to RL stating that all area-specific contract work is completed and request a formal contract modification to remove responsibility for the area turned over in support of eventual contract closeout.

INCREMENTAL BUSINESS CLOSURE

Closure of the business is not directly related to completion of the work but should also be executed incrementally.

Proactive divestment of business processes, physical facilities, and staff should follow a model that is depicted in Figure 5.

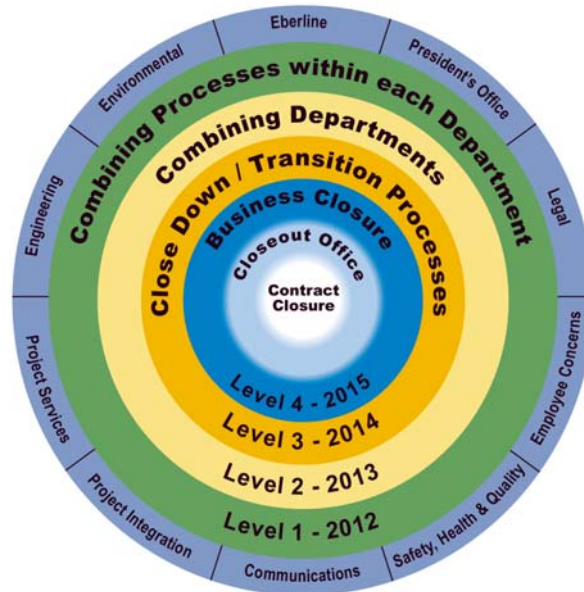


Figure 5. The incremental divestment wheel.

This model portrays how incremental closure affects staffing numbers, organizational levels, and process reductions. Progressive reductions per year show staff reductions alongside a collapsing and merging organization.

In addition to supporting incremental area closures, as RCCC closure approaches, the business units will have to accept increasingly more risk as they eliminate and reduce processes. This should be done using a considered and disciplined approach that looks for areas that can be impacted and will accept more risk without greater liability.

The processes should then be evaluated to determine the processes/deliverables and associated risks or consequences that can be minimized or removed. The company should be willing to tolerate greater business practice risk within the company and with the parent corporations, and should begin to assume slightly more risk with customer's commitments. Acceptance of additional risk with requirements, the contract, and mandatory or legal obligations will be minimal.

ABCs of Business Closure

The ABCs of Business Closure focuses resources on the following areas:

Area Closure. As the field work is completed and the areas closed, reducing the WCH liability, the function must fully divest themselves of any interest in that area. Each area closure is a mini contract closure and all business associated with the area should be completed.

For some functions it will mean partially closing or completing business lines, obligations, deliverables, or whatever work was specifically associated with the area being closed. Other functions will continue to run processes uninterrupted. The key is to have the area closure coordinated with each functional group to assess the impact of the area closure. This is a part of the Area Closure Evaluation Process.

Business Closure. This phase was created to force the incremental closure of the functions regardless of the impact of the area closures. Each function will have preset targets to reduce the size, complexity, and cost of the business service provided. The preset targets will drive down the functional groups regardless of the impact of the area closure.

Contract Closure. As identified by the WCH Prime Contracts Matrix, DOE Directives Applicability Matrix, and WCH SH&Q Source Document and Applicability Matrix, each functional group must continue to meet its contractual obligation and must have a plan for how all of the contractual obligation will be met for the final time. This will ultimately define completion for the function's plan for going out of business.

IMPLEMENTATION

The success of the Closure Strategy to date has resulted in the following:

- **Contract Clarifications to Facilitate Closure.** Partnering with RL, The Team was able to clarify the contract language to reflect the changes in the revised approach to the long-term stewardship requirements for the Hanford Site River Corridor. The revised approach allows for the turnover of geographical areas of land as it is cleaned-up to reduce the active clean-up footprint. This supports the RL 2015 vision.
- **Development of the Turnover Package Template.** WCH worked closely with MSA, CHPRC, and RL in the development of the Integrated Long-Term Stewardship Turnover Package Template. The template will ensure that consistent information is collected among the prime contractors and that this information meets all the requirements established by the Hanford Long-Term Stewardship Program Plan.
- **Turnover of Geographical Areas.** At the end of 2010, RL was able to report that all field work in Segments 1 (72,519,667.08 m² [28 mi²]) and 2 (82,879,619.52 m² [32 mi²]) were completed and have begun the turnover process for long-term stewardship. Completion of Segment 3 (98,419,548.18 m² [38 mi²]) field work will be accelerated 11 months from December 2012 to January 2012, with the turnover process following. These completions will provide RL with 253,818,834.78 m² (98 mi²) of River Corridor Footprint reduction, approximately 45% of the River Corridor.
- **A Screening Process for Changes.** Initial work has begun to develop a screening process to evaluate changes resulting from directives and orders and determine a graded approach and path forward on implementation. Working closely with RL is critical to the success of this process.

WM2011 Conference, February 27 - March 3, 2011, Phoenix, AZ

- Created Closure Organization. WCH has announced a new Director of Closure and closure organization. This change is moving from a start-up phase of developing and preparing Hanford's first contract closure process to the next phase of implementation as WCH moves toward closure.

The newly formed Closure Organization will continue to coordinate and facilitate the strategic and tactical plans to close the RCCC while supporting the RL 2015 Vision.