Hazardous Waste e-Manifest System Advisory Board

Background White Paper

Abstract

This document is intended to provide background and system development information about the progress of the EPA Hazardous Waste Electronic Manifest (e-Manifest) Initiative for the first meeting of the Hazardous Waste e-Manifest System Advisory Board in January 2017.

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Acronym List

ACH	Automated Clearing House
AoA	Analysis of Alternatives
CDX	Central Data Exchange
CESQG	Conditionally Exempt Small Quantity Generator
CONOPS	Concept of Operations
COR	Copy of Record
COTS	Commercial Off-the-Shelf
CPI	Consumer Price Index
CROMERR	Cross-Media Electronic Reporting Rule
DOT	Department of Transportation
EDI	Electronic Data Interchange
EPA	Environmental Protection Agency
FACA	Federal Advisory Committees Act
FTE	Full-time Equivalent
GSA	General Services Administration
IT	Information Technology
MVP	Minimally Viable Product
OCR	Optical Character Recognition
OLEM	Office of Land and Emergency Management
RCRA	Resource Conservation and Recovery Act
SDLC	System Development Lifecycle
TRC	Technical Review Committee
TSDF	Treatment, Storage, and Disposal Facility

Purpose

In accordance with the provisions of the Hazardous Waste Electronic Manifest Establishment Act, 42 U.S.C. § 6939g and the Federal Advisory Committee Act (FACA), 5 U.S.C. App.2, the Environmental Protection Agency (EPA) has convened its Hazardous Waste Electronic Manifest System (e-Manifest) Advisory Board to hold its first Federal Advisory Committee meeting.

The purpose of this meeting is to address critical policy and system development issues that need resolution prior to launching the e-Manifest system. Specifically, the e-Manifest Advisory Board will provide recommendations on matters related to the operational activities, functions, policies, and regulations of EPA under the e-Manifest Act, including:

- Architectural design and effectiveness of the e-Manifest information technology (IT) system and associated user fees and processes
- Matters and policies related to the e-Manifest program
- Discussions and matters related to the hybrid electronic manifest submission approach;
- Regulations and guidance as required by the e-Manifest Act
- Actions to encourage the use of the electronic (paperless) system
- Changes to the user fees as described in Section 3024(c)(3)(B)(i)
- Issues in the e-Manifest area, including those identified in EPA's E-Enterprise strategy that intersect with e-Manifest system, such as
    - Business-to-business communications
    - Performance standards for mobile devices
    - EPA's Cross Media Electronic Reporting Rule (CROMERR) requirements.

This meeting is soliciting input and comment from hazardous waste industry stakeholders, such as hazardous waste generators; transporters; treatment, storage, disposal facilities (TSDFs); brokers, trainers, and third-party providers; trade associations; federal and state regulating agencies; and the public at large.

The agenda for the meeting is as follows:

- Day 1: EPA Presentations on the User Fee Rule and System Development
- Day 2: Public Comment
- Day 3: Advisory Board Deliberations

Background

EPA's initial proposal to transition from paper-based to electronic-based reporting occurred in May 2001. After receiving numerous comments, conducting several national stakeholder meetings, and proposing supplemental notices on the subject, the Agency was persuaded that electronic manifesting would produce numerous benefits. These benefits include cost savings, better and more timely information on waste shipments, rapid notification of discrepancies or other problems related to a particular shipment, the creation of a single hub for one-stop reporting of manifest data to EPA and states, increased effectiveness of compliance monitoring of waste shipments by regulators, and the potential for integrating manifest reporting with the Resource Conservation and Recovery Act (RCRA)

biennial reporting process and other federal and state information systems. A summary of the historical actions on the e-Manifest initiative is presented in Figure 1.

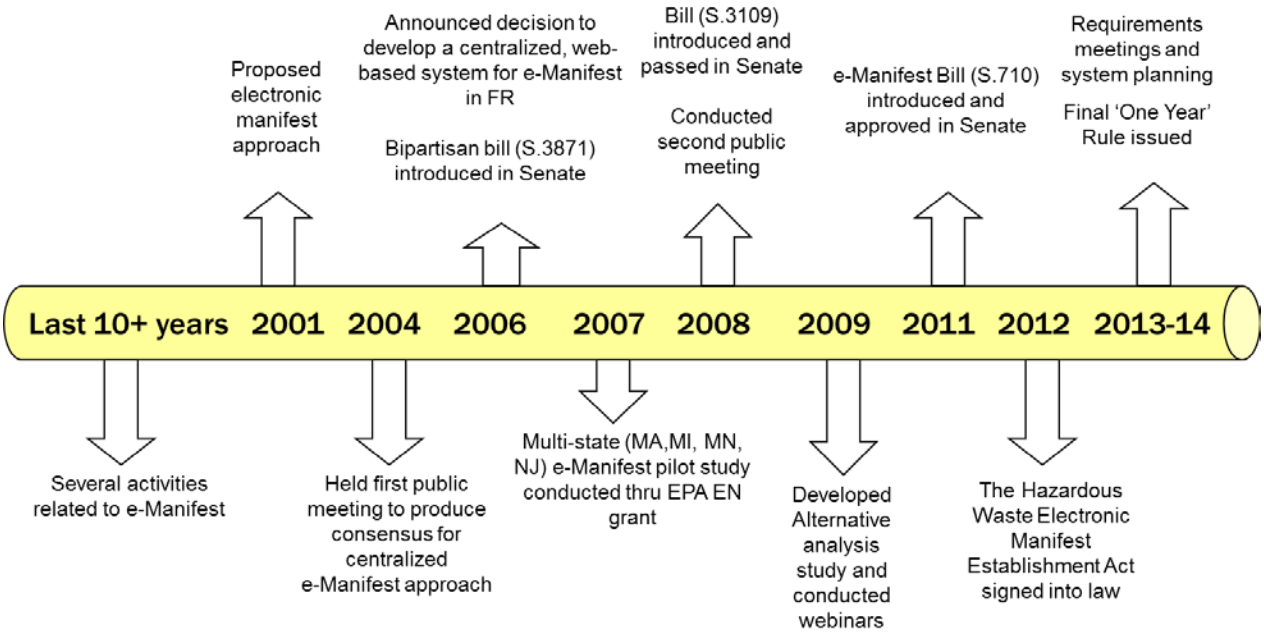

Figure 1: History of e-Manifest

The overarching purpose of the e-Manifest initiative is to establish a national IT system that will enable the Agency and the hazardous waste program's industry and state stakeholders to transition from a paper-intensive and burdensome process to a more streamlined, efficient, and automated system to track and manage hazardous waste shipments. This program is underpinned by several legislative and regulatory actions, which are described in the following sections.

Hazardous Waste Electronic Manifest Establishment Act

On October 5, 2012, President Obama signed into law the Hazardous Waste Electronic Manifest Establishment Act, which authorized EPA to implement a national electronic manifest system. Key features of the Hazardous Waste Electronic Manifest Establishment Act include the following:

- e-Manifest extends to all federally and state-regulated wastes requiring manifests
- The use of electronic manifests is optional for users, and authorizes central collection of data from electronic and paper manifests
- EPA is authorized to collect reasonable user fees for all system-related costs, including development and maintenance
- EPA must establish a uniform effective date in all states for e-Manifest, and must implement e-Manifest until states are authorized
- EPA is to establish a 9-member Advisory Board, also known as a Federal Advisory Committees Act (FACA) committee
    - Includes EPA Chair, 2 IT experts, 3 users from industry, and 3 state program representatives

    - Purpose: to provide recommendations on matters related to the operational activities, functions, policies, and regulations of the EPA under the e-Manifest Act
- Measures of effective system performance
    - Meets the needs of the user community, including states that rely on data
    - Attracts sufficient user participation and service fee revenues to ensure the viability of the system
    - Decreases the administrative burden on the user community
    - Provides waste receipt data for the RCRA Biennial Report

Section 2(c) of the e-Manifest Act authorizes EPA to impose and collect reasonable service fees necessary to pay the costs of developing, operating, maintaining, and upgrading the e-Manifest system, including any costs incurred in collecting and processing data from any paper manifests submitted to the system after its operation date, and to deposit these fees into a special revolving System Fund (or Fund) in the U.S. Treasury authorized under section 2(d) for the receipt of these funds. Section 2(c)(2)(A) of the Act further provides EPA with discretion to collect fees from users either in advance of, or as reimbursement for, the provision of services.

On the issue of fee adjustments, section 2(c)(3)(B) of the Act states that EPA shall, in consultation with the Advisory Board, increase or decrease the amounts of the fees so that the amounts collected and aggregated in the System Fund are sufficient (and not more than reasonably necessary) to cover current and projected system costs, including necessary upgrades. Moreover, the fees should be maintained at levels that minimize, to the maximum extent practicable, the accumulation of unused amounts in the Fund. Where the timing of fee adjustments is concerned, section 2(c)(3)(B)(iii) of the Act specifies that the fee schedule shall be adjusted initially when start-up costs have been recovered, and periodically thereafter, whenever an annual audit report on the system's finances discloses a significant disparity between fees collected in a fiscal year, and expenditures made for system related services during that fiscal year.

Section 2(d)(2)(A) of the e-Manifest Act authorizes the Secretary of the Treasury, upon request by the Administrator of EPA, to transfer to EPA such amounts from the Fund that Congress has appropriated to the Agency to pay the costs incurred in developing, operating, maintaining, and upgrading the e-Manifest system. In accordance with section 2(d)(2)(B) of the e-Manifest Act, such funds will be available to EPA to spend on system-related costs without fiscal year limitation, to the extent of and in the amount provided in appropriations Acts.

Section 2(d)(3)(A) requires the submission to Congress every two years a report that includes an accounting of the fees collected and expenditures made over the reporting period, as reflected in the system's financial statements.

Section 2(g)(1)(B) of the e-Manifest Act authorizes EPA to promulgate regulations that may include such requirements as the Administrator determines to be necessary to facilitate the transition from the use of paper manifests to the use of electronic manifests, or to accommodate the processing of data from paper manifests to the electronic manifest system, including requirements that users of paper manifests submit to the system copies of the paper manifests for data processing purposes.

Section 2(g)(2) of the e-Manifest Act provides that EPA's final regulations carrying out the legislation shall take effect in each state on the effective date specified in EPA's regulation, and that EPA shall carry

out the electronic manifest final regulations unless and until the authorized state program is fully authorized to carry out the electronic manifest regulations in lieu of the EPA. EPA implemented this authority with the February 2014 One Year Rule.

Section 2(g)(1)(B) authorizes EPA to collect for data processing purposes any paper manifests that continue in use after the implementation of electronic manifests, so that there will be one unified data system managing the data from both electronic and paper manifests.

The One Year Rule of February 2014

In response to the e-Manifest Act's mandate to issue regulations authorizing electronic manifests within one year of enactment of the statute, EPA issued its first final regulation pertaining to e-Manifest on February 7, 2014 (79 FR 7518). Because of the mandate to issue this final regulation within one year of the statute, EPA refers to this regulation as the e-Manifest One Year Rule.

The purpose of the One Year Rule was to codify key provisions of the Act touching upon the scope of users and manifests eligible to participate in e-Manifest, codify the provisions of the Act requiring consistent implementation of electronic manifests in all the states, finalize EPA's decision to establish a national electronic hazardous waste manifest system, and announce policy decisions related to using and implementing electronic manifests. The Rule thus establishes the legal and policy framework for the use of electronic manifests.

Fundamentally, the One Year Rule provides clarity with respect to the validity of electronic manifests. It explains that the electronic manifest format obtained from, and supported by, the national e-Manifest system shall be the one electronic manifest format authorized for national use, that electronic manifests obtained from and submitted to the e-Manifest system in accordance with the One Year Rule are the legal equivalent to paper manifests in all relevant respects, and that all authorized states must respect the validity of the national electronic manifest and revise their authorized programs to allow the use of electronic manifests.

Additionally, the One Year Rule codifies the scope provisions of the Act that extend e-Manifests to all federally and state regulated wastes that require a manifest. Therefore, the Rule clarifies that the e-Manifest system will collect manifests for RCRA hazardous wastes and additional hazardous wastes or special wastes that are currently regulated by the states but not by the federal RCRA Hazardous Waste program. The current paper manifest system covers all such wastes, so this requirement extends the existing policy to electronic manifests, consistent with the Act.

The One Year Rule further announces, consistent with the mandate of the Act, that the final electronic manifest requirements established by this action will be implemented in all states on a uniform effective date established for the national e-Manifest system. The uniform effective date for the e-Manifest system will be announced by EPA in the Final Fee Rule notice or in another subsequent notice that EPA will publish prior to the implementation date of the system.

Finally, the One Year Rule clarifies that manifest data should not be subject to confidential business information claims or protections, and explains how e-Manifest and the recommended electronic signature methods discussed in the Rule's preamble will comply with EPA's electronic reporting policies as articulated in the Agency's Cross-Media Electronic Reporting Rule (CROMERR) (October 13, 2005; 70 FR 59848).

While the One Year Rule addresses the fundamental scope and policy issues related to the use of electronic manifests, it does not speak to user fees to any significant extent. EPA concludes that the development of an e-Manifest user fee methodology and fee schedules would be undertaken as a separate rulemaking, that is, the e-Manifest User Fee Rule. Additional details regarding the User Fee Rule is provided in the User Fee Proposed Rule section.

e-Manifest System Summary

Currently, the paper-based manifest system consists of a 6-copy form that must be completed, physically carried, signed, filed, and mailed. The paper manifest satisfies both EPA's and DOT's requirements for a shipping document – a record of information on types, quantities, hazmat description, and routing. When completed, the e-Manifest system will be a centralized repository for both paper and electronic manifests, as required by the e-Manifest Act. When complete, the e-Manifest system will allow for:

- Fully electronic manifest creation and workflow addressing the needs of industry users
- Ensuring EPA has the infrastructure to handle over 25,000 manifest per day
- An Application Program Interface (API) for paper processing centers to input data to e-Manifest
- A fully functional IT help desk
- State access to manifests and the ability to direct TSDFs to make corrections
- Robust user administration and authentication
- The ability to handle a variety of user-preferred methods of manifest access, including the rail industry's electronic data interchange (EDI) system, electronic batch submission, manual/direct data entry, or access in an offline environment
- Electronic signature capture
- User fee administration

In brief, e-Manifest will:

- Allow hazardous waste handlers and EPA to track off-site shipments of hazardous waste from the point of generation to disposition
- Make the e-Manifest form and data available to users as an alternative to the paper manifest forms
- Facilitate the electronic transmission of the uniform manifest data and enable the use of the e-form more cost effective and convenient for users.

A graphical representation of the concept for the e-Manifest system and flow of data through the system is presented in Figure 3.

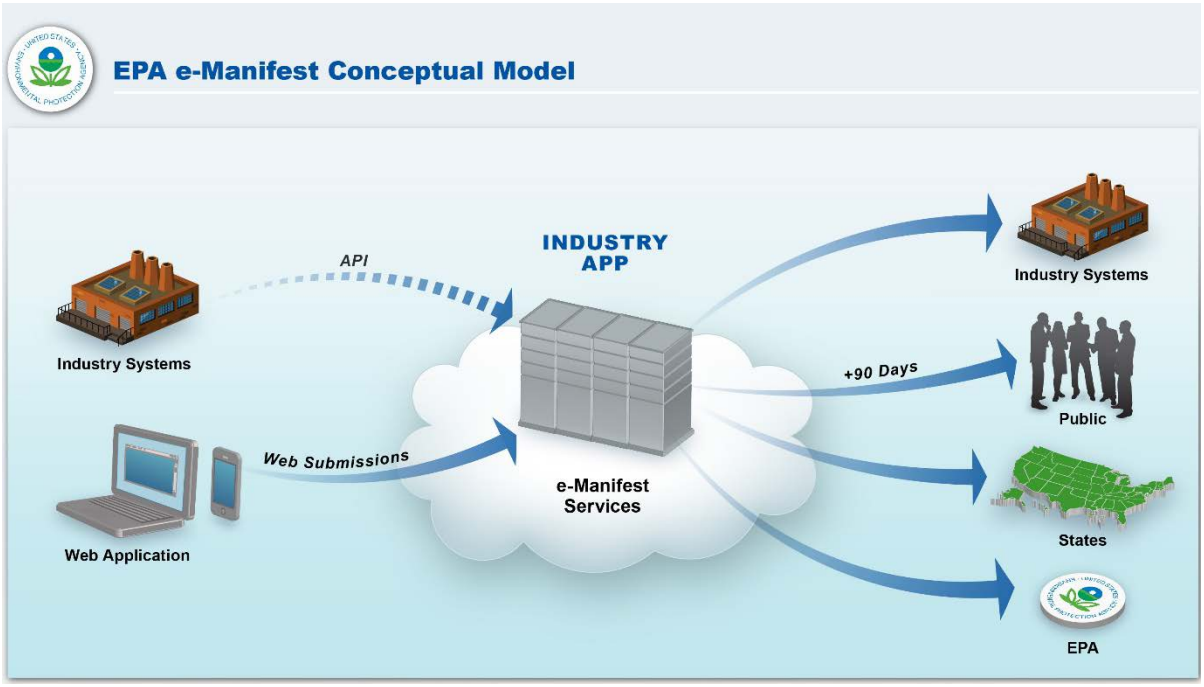

Figure 2: Overall e-Manifest Concept

e-Manifest is the flagship component of EPA's E-Enterprise initiative. E-Enterprise is a new model aimed at streamlining EPA's interactions with the regulated community by providing a single gateway for implementing environmental programs. e-Manifest will leverage EPA's Shared Services via E-Enterprise, utilizing the EPA Central Data Exchange (CDX) for user registration, CROMERR services, and RESTful Service API through Envirofacts. e-Manifest will deploy with the functionality to both submit, edit, and sign manifests through a web application and through APIs, allowing a System-to System Data Exchange. There will be three ways for users to submit manifest data to EPA:

- **Paper:** Paper processing center
- **Web-Based System:** Industry, State, Public user access the web-based system via an industry-managed machine
- **System-to-System:** Industry and State systems accessing e-Manifest's industry API

In order for the use of electronic manifests to be more efficient than the paper process, the e-Manifest workflow must be intuitive and accommodate users with various system needs, including the availability of the system in an offline mode (without network connectivity).

The e-Manifest system's electronic workflow shall follow the existing 8700-22 Uniform Hazardous Waste Manifest form. The workflow shall include a traditional workflow as well as workflows for rejections and discrepancies, but only as defined by federal regulations. Further, per the Final Rule, individual manifests and their workflows must be either all electronic or all paper. For example, a manifest that begins electronically must end electronically, with all users along the chain-of-custody using electronic manifests, except in times of system downtime as defined by the final One Year Rule. However, based on discussions with stakeholders, EPA backed away from the all or none approach. In the July 26, 2016,

Fee Rule proposal, EPA asked for comment on a proposal that would allow mixed or hybrid paper/electronic manifests in limited circumstances[1].

The Agency requires the e-Manifest system to be able to handle the input of over 5 million (paper or electronic manifests) per year. EPA does not assume 100% adoption of the electronic workflow at the beginning of the program, however, EPA desires a scalable system that can handle upwards of 5 million manifests per year. Each electronic manifest will have a minimum of three signature events that comply with applicable CROMERR requirements, with at least the final TSDF signature event creating a CROMERR COR. These signatures reflect each chain-of-custody event where handlers sign the manifest to transfer the waste shipment to the next entity. The CORs, plus the active and final manifest data, will be maintained in the system for access by appropriate handlers and states. In the event a user needs to re-sign an electronic manifest, they will create a new COR. The new COR will be in addition to any previous CORs for that user and manifest.

As stated, the Agency requires the e-Manifest workflow to offer several options for the regulated community to interact with the e-Manifest system. EPA envisions, to the extent possible, a services-based architecture utilizing EPA shared services. Those services will be employed by an e-Manifest web application, native mobile application, and any industry systems that want to interact with e-Manifest. The regulated community should have the option to set up their systems to create, edit, modify, route, and/or download completed and in-process manifests, but use the web application or native mobile application to register users and sign manifests in compliance with CROMERR. Further, the regulated community, if feasible, should have the ability to implement a full system-to-system architecture where they may register users, create, edit, route, apply CROMERR-compliant signatures, and download completed and in-process manifests in their systems.

For users that do not wish to use their own systems to interact with the e-Manifest system, EPA envisions users having the option of using a responsive web application and a native mobile application. As stated, the web application and native mobile application should be built on the same services that are exposed to the regulated industry. The web application shall allow users to register, create, upload, edit, route, apply applicable CROMERR-compliant signatures, download completed and in-process manifests, and allow users to share manifests with other individuals. EPA also envisions that both the web and native mobile applications be able to utilize the witnessed signature approach.

The hazardous waste manifest process, as supported by the manifest form (EPA Form 8700-22) and manifest continuation sheet, (EPA Form 8700-22A[2]), represents a unique, chain of custody and transactional process. Contrary to most EPA programs and reporting requirements that require one-time or annual reporting, manifest forms accompany the transportation of hazardous waste, which occurs 24 hours a day, and requires the signature of all individuals involved in the chain of custody. The manifest requirements also apply to a very wide, diverse range of stakeholders, from large commercial TSDFs to small, family owned hazardous waste generators. As a result, the e-Manifest system will also be a unique system with unique functions and requirements.

[1] This is discussed in greater detail in the section titled *OLEM's Hybrid Manifest Proposal and Phase-in of Electronic Manifesting*

[2] See attached EPA Forms 8700-22 and 8700-22A

Agile System Development

In 2012, based on the authority of the Act, EPA accelerated efforts on the e-Manifest initiative that had been in progress for many years prior to the Act, including the development of system architecture plans. The system architecture efforts included the following activities:

- In Spring 2013, EPA conducted three system requirements analysis meetings and two webinars in which EPA gathered and documented functional requirements from industry and state stakeholders
- In May 2013, EPA completed an Analysis of Alternatives (AoA) and cost benefit analysis (CBA) that identified and evaluated the components and costs of various system implementation approaches
- In September 2013, EPA completed a Concept of Operations (CONOPS) document that describes the e-Manifest system's high-level architecture and design approach illustrating data flow through the system
- Beginning in 2013 to the present, EPA conducted more detailed requirements gathering and documentation, resulting in more than 700 functional and technical requirements
- Throughout 2014, EPA led a series of 15 webinars, working extensively with commercial users on identifying and addressing their issues and met regularly with state partner organizations.

Through these early system architecture development efforts, EPA identified a couple of key concepts for the e-Manifest system. First, through the extensive market research conducted in the AoA, EPA concluded that there was no single system or commercial off the shelf (COTS) solution that can be easily modified to conform to the statutory requirements of the e-Manifest Act. Second, to realize the significant benefits of an e-Manifest system, a broad range of private and public sector stakeholders must use it. To help ensure that use, the system must meet stakeholder needs.

In June 2012, the White House issued guidance to all Executive Agencies directing a shift from traditional waterfall best practices to more modular and agile approaches[3]. As EPA and other Agencies adjusted their Systems Development Lifecycle (SDLC) to be complaint, the e-Manifest program also altered its approach to embrace agile in 2014. Adopting an agile approach provides EPA with the opportunity to collect and adjust to user feedback during development, allowing for immediate design modifications to improve system usability and increasing user acceptance rates.

As part of the agile development focus, in September 2015, EPA partnered with 18F, an office within the General Services Administration (GSA) Technology Transformation Service, to develop a system demonstration. There was an initial demonstration of system functionality delivered in September 2015, and a minimally viable product (MVP) which was deployed in March, 2016. The March release was focused on one key aspect – the last transaction in the chain-of-custody when the hazardous waste arrives at the designated waste management facility, and that facility signs the electronic manifest verifying the hazardous waste types and quantities received. Getting the system to properly capture this critical manifest transaction was an imperative first step. EPA worked with several industry users to develop this initial system functionality.

[3]Contracting Guidance to Support Modular Development, June 14, 2012, https://www.whitehouse.gov/sites/default/files/omb/procurement/guidance/modular-approaches-for-information-technology.pdf

Starting with this initial system, EPA has been adding more functionality in an incremental manner. Research has shown that using this type of lean start-up methodology with agile techniques lowers the cost of current and future system development by addressing uncertainties sooner rather than later. Therefore, EPA has been conducting user-centered design and development, starting with the small scale demonstration phase. Open source code and project engages industry and state users in the early phases of development, creation of development platform, and hosting environment. EPA will expand engagement efforts to all users over time (e.g., states with no systems, large and small generators, etc.).

The agile software development methodology embodies continuous improvement through iterative development and delivers software in sprints. Agile embraces change, continuous and regular feedback and improvement, value-driven delivery, full-team collaboration, and learning through discovery. Agile techniques cannot eliminate the challenges intrinsic to high-discovery software development but by focusing on continuous delivery of incremental value and shorter feedback cycles, they expose challenges as early as possible to allow for immediate correction.

EPA has adopted the lean start-up product development strategies with agile, user-centered software design/development methodologies and as implemented the following:

- Two-week sprint intervals
- Using modular development practices, relying heavily on available off-the-shelf software modules, by building individual working pieces of the system and integrating them into the whole
- Addressing uncertainties that arose during the initial architecture planning work, and engaging early with users and stakeholders
- Bringing down the cost of current and future development by addressing risk upfront and ensuring that the work being completed brings actual value to stakeholders and users
- Continuously improving, using iterative processes, and engaging regularly with users and stakeholders throughout the life of the program.

In keeping with the idea of services first, EPA has made every effort to involve industry users in the development process to build the strongest possible system. During the system development phase, the e-Manifest team will work alongside industry, states, and other stakeholders, by focusing on issues raised and addressing the issues, including the following:

- How the national e-Manifest system will connect with state and industry systems
- How the national paper manifest processing system/center will operate
- How to approach manifest QA/QC on a national and state level
- Addressing state data access needs
- How help desk operations will function.

The e-Manifest team communicates regularly with states, industry, and related stakeholders about ongoing developments (i.e., continued release and testing of system iterations), updates on e-Manifest related rules (i.e., user fees for the e-Manifest system and amendments to manifest regulations), and the national launch of the e-Manifest system.

Our primary methods of communication include the following:

- The e-Manifest website[4]
- Listserv (general interest and development-focused)
- Public webinars[5]
- Blog posts[6]
- Trello – project management[7]
- GitHub – code repository and project management[8]
- FACA Meetings[9]
- Focused, informal meetings with specific stakeholders.

System Development Timeline

Assuming EPA receives adequate funding in fiscal years 2017 and 2018, the agency anticipates that the e-Manifest system will be operational in June 2018 (see Figure 4). The currently expected high-level milestones, subject to change, until system deployment in 2018 are as follows:

- **Fall 2016 to early 2017**: Development and release of Phase 1 of e-Manifest, which will utilize the hybrid approach described previously; initial user testing in early 2017
- **Early 2017 to June 2017:** Testing and refinement of Phase 1, with deployment to the pre-production environment for further user testing planned for June 2017; features of Phase 1 include:
    - Generator input, no signature
    - TSDF input, with CROMERR signature
    - Upload of manifest, including images
    - Ability to sign data using CDX services
    - Ability to retrieve data by manifest number (get service)
    - Data validations
    - User administration
    - Adding brokers to handler
    - Bulk signatures
    - Non-handler RCRA identification (ID) numbers
- **June 2017 to early 2018**: Continue full scale development; after Phase 1, EPA will continue to iterate so that the e-Manifest system can accommodate additional use cases; initial user testing in early 2018
- **Early 2018 to June 2018**: Testing and refinement of Phase 2, with deployment to the pre-production environment for further user testing planned for February 2018; features of Phase 2 include:
    - Additional CROMERR signature options
    - Data access and reporting – state, tribal, EPA, public, and industry
    - Corrections process

[4] , https://www.epa.gov/hwgenerators/hazardous-waste-electronic-manifest-system-e-manifest
[5] https://www.epa.gov/hwgenerators/webinar-implementing-hazardous-waste-electronic-manifest-establishment-act-e-manifest
[6] https://blog.epa.gov/blog/2016/03/e-manifest-tapping-into-americas-expertise-to-build-a-national-system/
[7] https://trello.com/b/0geMlbgF/epa-emanifest
[8] https://github.com/USEPA/e-manifest
[9] https://www.federalregister.gov/documents/2016/12/07/2016-29340/hazardous-waste-electronic-manifest-system-e-manifest-advisory-board-notice-of-public-meeting

- Associated handlers
- Atypical workflow
- Imports/exports (international)
- Discrepancies – section on form
- Manifests for Polychlorinated Biphenyls (PCBs)
- Manifest routing/workflow management to the paper processing center
- User fee regulatory development process completed (i.e., final rule) no later than 90 days prior to system online-deployment date and Pay.gov integration.

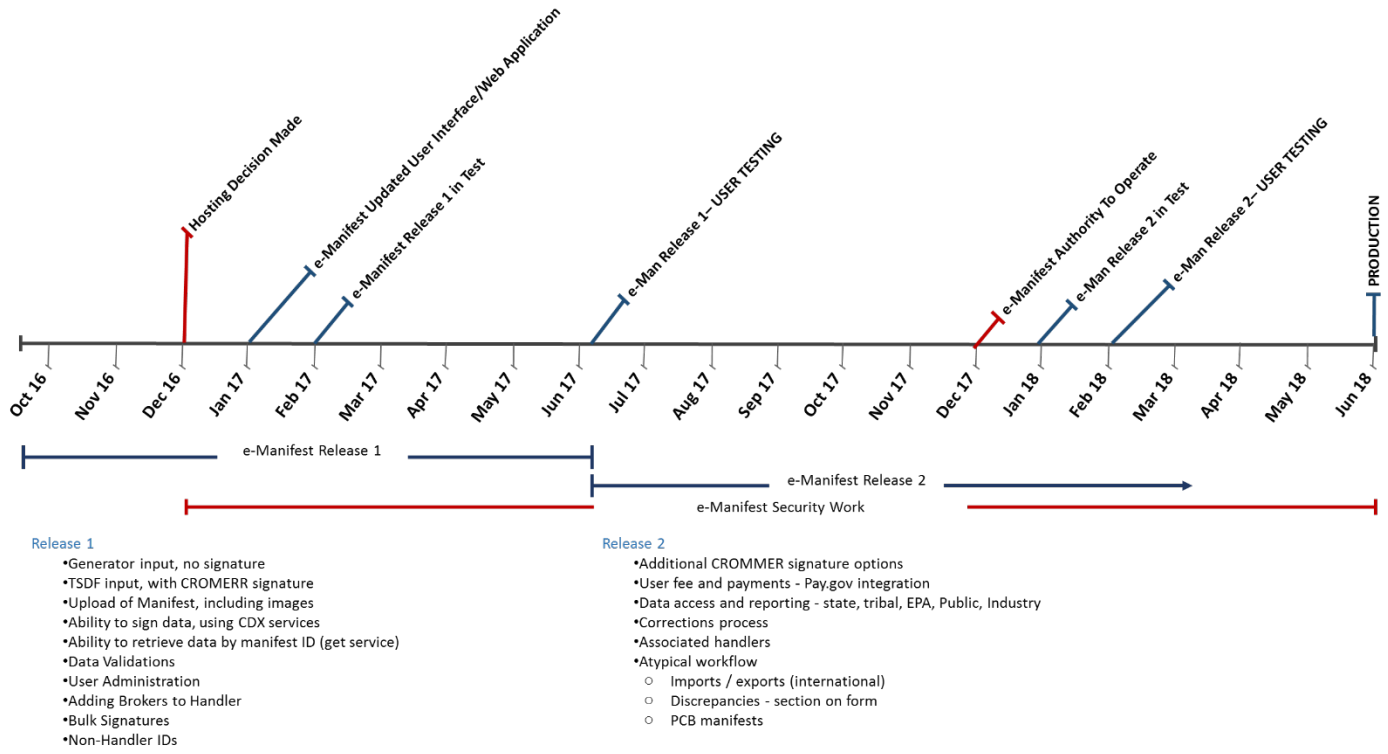

Figure 3: e-Manifest High Level Schedule and Milestones

Cloud-First Approach

In February 2011, the White House issued the Federal Cloud Computing Strategy[10], with the goal of reducing systems acquisition, operations, and maintenance costs. Cloud computing refers to the model by which systems are hosted at large data centers, where costs are reduced both through economies of scale and by allowing systems to only pay for the services used rather than the full cost of all potential use. For example, for a system hosted in a traditional manner (i.e., physical hosting), the Agency would be required to acquire and maintain servers, data storage (e.g., hard drives), software, and other resources to meet the maximum potential load of the e-Manifest system, plus redundant resources to handle disaster recovery and continuity of operations scenarios. In contrast, by utilizing a cloud hosting

[10] Federal Cloud Computing Strategy, February 8, 2011, https://www.whitehouse.gov/sites/default/files/omb/assets/egov_docs/federal-cloud-computing-strategy.pdf

solution, the Agency can dynamically adjust the number of servers, data storage, software, and other resources to meet the needs of the specific number of users at any given point in time. As more users use e-Manifest, the available resources are increased, increasing cost. Likewise, when fewer users are active, the available resources are decreased, decreasing costs. Additionally, rather than paying for the acquisition and maintenance of unused disaster recovery systems, the Agency can quickly acquire and implement disaster recovery services only when necessary and only pay for those systems when they are used.

To gain the cost and service benefits available from cloud computing, EPA has undertaken several cloud computing studies. In 2014, the e-Manifest Hosting Requirements Specification was developed to estimate the e-Manifest system resource requirements. Recognizing the significant expenditures that would be required for EPA to host the e-Manifest system via traditional hosting, EPA conducted a Cloud Computing AoA in 2016 that showed both technical flexibility, increased scalability and extensibility, and potential cost savings through the use of commercial cloud hosting vendors. Based on this analysis, EPA is currently moving towards finalizing the decision to host e-Manifest at a FedRAMP certified third-party commercial cloud hosting provider data center. The final selection is expected to provide greater capabilities to both the end users and to EPA at reduced cost levels. In turn, such a decision will help in setting acceptable fee levels for the e-Manifest system use.

Electronic Signature

For the e-Manifest system, users must comply with all applicable EPA CROMERR requirements as well as all applicable EPA electronic reporting (E-Reporting) requirements. CROMERR sets performance-based, technology-neutral standards for systems that states, tribes, and local governments use to receive electronic reports from facilities they regulate under EPA-authorized programs and requires program modifications or revisions to incorporate electronic reporting. CROMERR also addresses requirements pertaining to electronic reporting directly to EPA information systems. Additional information about CROMER is available at http://www.epa.gov/cromerr.

EPA program and regional operating systems that receive electronic reports must document consistency with CROMERR standards and apply to the EPA Technical Review Committee (TRC) for certification of system compliance. System certification is based on an assessment of how electronic reporting systems meet the technology-neutral, performance-based criteria in CROMERR. CROMERR's criteria to evaluate electronic reporting systems are in part, based on the need to prove in enforcement proceedings the following: electronic reports are what they purport to be, their content is unchanged, and electronic signatures were executed by the designated signatories. The performance-based criteria address a number of topics including:

- Criteria for establishing a COR
- Integrity of electronic document
- Opportunity to review and repudiate COR
- Validity of electronic signatures
- Determination of the identity of the individual uniquely entitled to use a signature device
- The system may potentially have and utilize several options to meet CROMERR
- CROMERR through CDX
- APIs utilizing EPA’s Shared CROMERR Services.

There have been additional topics related to CROMERR that EPA has evaluated during the development of the e-Manifest system, including the following:

- The use of digitized signature pads and pens as per the February 7, 2014, final rule
- The use of the witnessed signature approach as per the February 7, 2014, final rule
- The offeror/"on behalf of" concept as described in various documents in RCRA Online (including documents but not exclusive of RCRA Online numbers 11108, 11199, 11372, 14687)[11]
- The option of the generator and transporter continuing to use paper and then the TSDF signing the data with a CROMERR compliant signature.

For the hybrid electronic manifest submission (see Figure 2), EPA has proposed in the User Fee Rule that the generator, transporters, and TSDF receiving personnel would sign in ink on a paper manifest and the TSDF would track the manifest in its electronic system. When the company submits the data using the "Manifest Post" API and the status as "Received/In process" or a later status, the manifest goes into a queue for electronic signing. The system would return to the company in the response a direct URL to their manifest signature queue and provide a number of outstanding manifests for signature.

Within 30 days of receipt of the manifest, a person that fits the description in §265.71(a)(1) would sign the manifests using the RCRA Industry application, either navigating to the queue in the RCRA Industry application from their own system, or by logging in directly to the RCRA Industry application and navigating to their outstanding manifests.

The user would then have the ability to review all of the manifests in their queue for signature and can sign one, many, or all outstanding, by invoking one signature ceremony and acknowledgement of all the manifests they are choosing to sign electronically.

Paper Processing

Electronic manifesting will be optional, which means that the regulated community will have the option to continue to complete manifests on paper and then submit to EPA. The final rule states that if using paper, the top copy of the paper manifest must be submitted to EPA. The final rule also states that aside from postal mail manifests, the regulated community can choose to electronically submit either an image file of the complete paper manifest or a data file with an accompanying image file of the complete paper manifest (see 40 CFR 262.71(a)(1)(v)). In this regard, the following three allowable submission mechanisms are considered part of the e-Manifest paper process:

1. Postal mail
2. Image file of a scanned manifest transmitted to EPA (e.g., possibly a PDF of a scanned manifest sent via the API)
3. Data file containing manifest data with an accompanying image file of the scanned manifest transmitted to EPA (e.g., possibly XML containing manifest data with an accompanying PDF sent through API).

The graphic below represents the paper submission process.

[11] These documents may be obtained by performing an Advanced Search for the RCRA Online Number at https://yosemite.epa.gov/osw/rcra.nsf/advanced+search?OpenForm

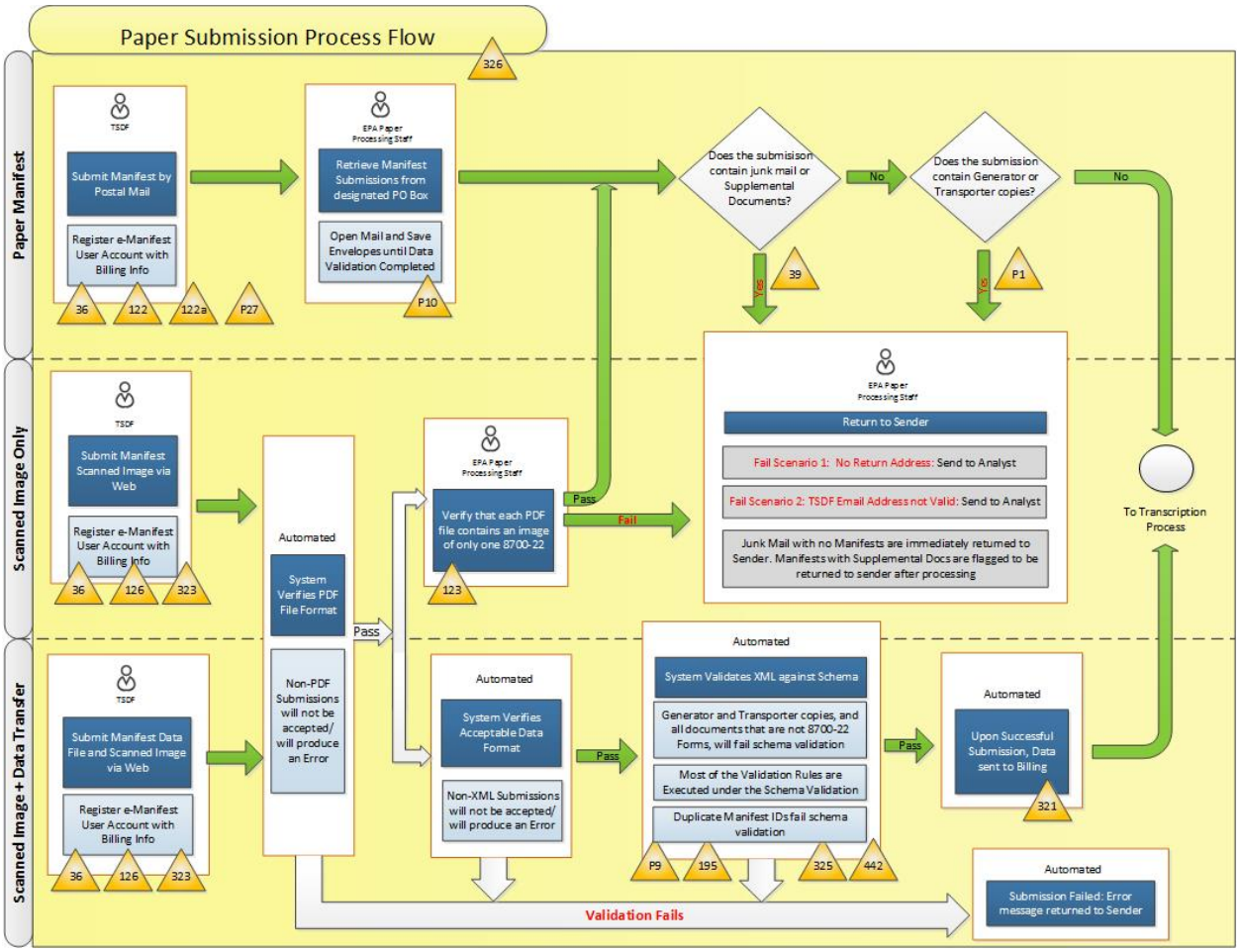

Figure 4: Paper Manifest Submission Process

For all of these submissions, industry will continue to use the paper manifest for the chain-of-custody from the generator to the TSDF, but under the new process, TSDFs will be allowed to mail the paper manifest or transmit the completed manifest data and/or image to EPA, instead of mailing the paper copy to the appropriate state(s). This work will include developing system components and processes for capturing data from paper manifests in electronic formats or receiving manifest data so that all manifest data (whether from paper or electronic manifests) is accessible through the e-Manifest system. Data entry screens will be built into the system to provide paper processing staff the ability to manually enter data to ensure paper manifest records are retained and accessible. EPA is expected to establish a paper processing center to provide industry a centralized location to mail paper manifests, central set of staff dedicated to reviewing, QA-ing, and transcribing data from paper manifests into the e-Manifest system. A few key considerations are specified here:

1. **Data entry quality:** Data from postal mail manifests and image file manifests must be keyed into e-Manifest at a determined level of quality. EPA believes that one method to reach the high level of quality required will be through double data entry with reconciliation of discrepancies between the entries. Related to this requirement, based on feedback from states, EPA does not believe that paper manifests are good candidates for optical character recognition

(OCR) software which is printed as a unique identifier on each manifest form by the registered manifest printers.

2. **Sorting manifests:** All manifests received on the 8700-22 and 8700-22a forms from designated facilities will be processed by the paper processing center, except for the transporter and generator copies (in other words, only the top copy of the manifest will be processed). If submitted, the transporter and generator copies will be returned to the sender.

3. **Supplemental and miscellaneous documents:** Based on discussions with states, EPA estimates that 5%-25% of all manifests currently submitted to state processing centers are accompanied by at least one supplemental document. The most common supplemental document received is a cover letter, but others include: Land Disposal Restrictions (LDRs), Import/Export documentation, Toxic Substances Control Act (TSCA) records, asbestos shipping records, corporate letters, and correction letters. The paper processing center should also expect to receive miscellaneous documents that may not be related to a manifest, or materials inadvertently submitted with a manifest, such as "junk mail" or documents that belong to another program at EPA. It is assumed that supplemental and miscellaneous documents will not be entered in to the e-Manifest system and will be returned to the sender.

4. **Retention of paper manifests:** Under the paper process, postal mail manifests will be discarded after the data is entered into the system and the image scan is verified. For electronic data submissions from paper manifests (e.g., PDF scans), EPA will store the scans electronically for at least three years. The paper copy of the manifest will be discarded after the data is keyed into the system and the image scan is verified. Image scans and data from a postal mail manifest will also be retained electronically for at least three years.

5. **Performance standards:** Performance standards or service level agreements related to paper processing will include such standards as: the quality of data captured in e-Manifest, average time to process manifests under each of the three submission mechanisms (active working time on a manifest), and the average number of days from receipt of a manifest until it is processed (number of backlog days).

6. **System components to support paper processing:** The paper process is anticipated to require several system components, such as, but not limited to: an application for manual data entry of manifests into e-Manifest; a user registration component for submissions under the paper process; a solution for users to submit image files or images and data; and a solution for the system to process image files or images and data.

7. **Billing:** The e-Manifest system will track and support collected and processed paper manifests for the purposes of supporting user fees charged for this paper processing.

8. **Final considerations:** Due to the potentially large scale of paper processing, EPA anticipates will need to be establish and operate a paper processing center with the following capabilities: the means to physically receive mailed paper manifests (e.g., a manifest program P.O. Box), scanning operations (for postal mail manifests), and the ability to identify, sort, and return generator and transporter copies.

Corrections Process for Manifest Data

As EPA explained in both the One Year Rule and the Fee Rule proposal, errors are inevitable with the preparation and use of manifests, particularly with the paper system and the manual processes used for initially entering data and then again when re-keying the data into the system. Our state partners, who have been involved for many years in operating tracking programs for data from paper manifests, report that as many as 20% of paper manifests that the states process include errors that require corrections.

Errors necessitating correction can arise from a number of sources. Experience with paper manifest reviews is rife with legibility issues from unclear handwritten entries or from data that did not transfer clearly through all of the six manifest copies in a set. The completion of the manifest by a user can introduce additional errors from missing or incomplete information, such as a missing, erroneous, or invalid mailing/site address, missing generator or facility ID numbers, ID numbers on manifests that do not correspond with the generator or facility named on the form, or that do not correspond with entries that exist for that entity in a database. Other common errors found on paper forms include missing or erroneous waste quantity information, units of measure that do not sync with container types, and missing or erroneous waste codes in Item 13 of the manifest. Other errors may arise because the generator has not yet been assigned an EPA ID Number (e.g., the generator is a conditionally exempt small quantity generator (CESQG); the generator has changed, closed, or been sold; or is a one-time generation site from a site remediation and has not yet been assigned a valid ID number). While rare, even receiving facilities may at times lack a valid ID number, such as with certain recycling facilities or facilities receiving non-RCRA and state-regulated wastes for which a valid EPA ID number does not exist.

Errors can result from erroneous transposition or interpretation of data or may occur because the information entered initially (e.g., waste quantities and types) on a manifest when a shipment is initiated is only an estimate or is based on process knowledge. At or shortly after receipt of waste containers by the TSDF, actual waste types, weights, and quantities may be determined more closely after shipment receipt. In other cases, the waste containers may be placed into storage at the TSDF, and a more accurate measurement of waste quantities and waste analysis of the wastes received may occur several months later when the containers are opened and the contents prepared for management or even re-shipment. Thus, data errors from numerous sources with paper manifests are inevitable, and any reasonable concern for manifest data quality necessitates an orderly process for correcting missing or erroneous data.

As EPA explained in the proposed Fee Rule, there are significant data quality concerns that make manifest data corrections a priority for program stakeholders. A great number of authorized states levy taxes or fees on hazardous wastes generated in or brought into the state for management. For these states, and for the facilities or sites that are assessed taxes or fees, it is critical that the proper site or facility be identified with the wastes and charged the tax or fee. It is equally critical that the amount of the tax or fee that is levied is based on accurate waste quantity and type information. In addition, since the e-Manifest Act mandates that EPA integrate the reporting of waste receipt information in e-Manifest with the RCRA Biennial Reporting process, EPA needs to be assured that manifest data are of high quality to support state and federal processes (July 26, 2016; 81 FR 49072, 49097).

In the July 26, 2016 proposed Fee Rule, EPA proposed an approach whereby the TSDFs that submit final manifests to the system are primarily responsible for making corrections to data from previously submitted manifests. The proposed rule presented for comment a process for executing data

corrections in the system, and discussed the roles and responsibilities of the TSDFs (receiving facilities) and other parties (generators and states) interested in the accuracy of manifest data.

EPA chose the receiving facilities or TSDFs as the party responsible for entering corrections as they are already responsible for certifying on the manifest to the receipt of hazardous wastes delivered to their facilities. These facilities are normally in the best position to determine the accuracy of waste receipt data and document changes to the data, such as when containers are opened and contents are verified. The receiving facilities are also responsible for preparing the RCRA biennial report and other summary reports of waste receipts required by states, and it is understood that many errors are discovered and data corrections occur during the preparation of these biennial and other waste receipt reports.

EPA believes it is preferable to have one party to these transactions responsible for entering corrections in the system. We believe that the TSDFs are best suited to perform this role, who may either suspect an error and bring it to the facility's attention or review and respond to data changes initiated by the facility. Therefore, the proposed data corrections regulation includes both a process for data corrections initiated by the receiving facility and a process for data corrections initiated by a generator or state interested in a particular hazardous waste shipment.

EPA also believes it is important that the proposed corrections process impose some discipline on when corrections may be made. In the February 2014 One Year Rule, EPA determined that manifest data would not be disclosed to the general public by the system until 90 days after the TSDF receipt of a manifested shipment. The 90-day delay of public release was premised on the need for shipment data to be processed, reviewed, corrected, and finalized in the normal course of business. EPA did not want to have data disclosed prior to a reasonable period of time elapsing for the facility to conduct data quality assurance and clean-up activities. Thus, for consistency with the One Year Rule's determination that manifest data are "in process" and not disclosed to the public for a period of 90 days post-receipt, EPA has proposed that data corrections must be completed within this same 90-day post-receipt window. We have heard from stakeholders in the past that for the great majority of waste shipments, 90 days is more than a sufficient time for data accuracy checks and corrections to be made. However, EPA is aware that there are circumstances (e.g., waste containers placed in long term storage and not opened for months after receipt, errors discovered during production of the biennial report) where the 90-day post-receipt deadline for submission of corrections is not practical. EPA included the 90-day requirement to deal with the majority of cases and to promote finalization of manifest data before their release to the public.

EPA is also proposing that all manifest data corrections be made by electronic means and not by paper submissions. As proposed, the TSDF making corrections could make changes directly in the system through the web application or by uploading a correction submission relating to one or to a batch of manifests. In either case, the proposed rule would require a facility representative to execute a CROMERR-compliant electronic signature certifying that to the best of that representative's knowledge or belief, the corrections submitted will cause the manifest data entered to be true, accurate, and complete. For batch correction submissions, only one certification need be executed by the facility representative.

As for the content of the correction submission, the proposed rule would require the correction submission to include this information:

- The Manifest Tracking Number and Date of Receipt by the facility of the original manifest(s) for which data are being corrected,
- The Item Number(s) of the original manifest that is the subject of the submitted correction(s),
- For each Item Number with corrected data, the data previously entered and the corresponding data as corrected, and
- The required certification statement, as discussed above.

For a data correction initiated by the TSDF, the proposed rule would require the TSDF to initiate a proposed data correction by the 60 days after receipt date of the waste shipment. Once the facility's proposed correction is received by the system, copies of the proposed correction(s) would be distributed to interested parties, including the waste handlers named on the manifest and to appropriate states. These interested persons receiving copies of the facility's proposed corrections would have 15 days to respond to the facility with their comments or their suggested changes. The receiving facility that initiated the correction would then be responsible for reconciling any comments from interested parties and would be responsible for finalizing the manifest data by the 90 days post-receipt date.

The correction process initiated by other parties is distinct but similar to the process for facility initiated changes. For these corrections, an interested person (other waste handler or state) would provide the receiving facility with notice of a suspected data error, clearly indicating the manifest items and data that are suspected to be in error, and where known to the other party, would also indicate the change required. The proposed rule would require this notice to be provided electronically to the facility no later than the 60 days after receipt date of the original manifest affected by the suspected data errors.

The facility receiving such a notice would have 15 days to respond to the notice of suspected error. The response could either be a correction submission addressing the identified error or a notice affirming that the previously submitted data are correct. This response would be shared with all the interested parties. By the 90 post-receipt date, the facility must reconcile any notices and comments and enter the final data believed to be correct. Again, the receiving facility is responsible for reconciling the information in the interested parties' notices and comment and would have the last word on making the required corrections.

EPA notes that it is not the purpose of the proposed corrections process to result in amended manifests being executed and recirculated to interested persons. Rather, this corrections process is intended to produce changes to the data on waste receipts that were entered in the e-Manifest data repository in response to previously submitted manifests.

e-Manifest IT Support Help Desk

In order to accommodate the unique aspects of the e-Manifest system, the help desk will need to tailor its operations to provide the best possible support for users. The e-Manifest help desk will not provide regulatory guidance and shall direct callers with RCRA regulatory or programmatic inquiries to the appropriate resource(s) as directed by EPA. At this time, the operating timeframes required have not yet been determined, however, the agency may require 24/7/365 help desk operations (or at a minimum, operations which run Monday through Friday during regular business hours).

Along with the standard means of receiving tickets from users such as telephone and e-mail, the help desk may need to offer support through chat, directly through the system (via the web application

or native mobile application), and/or social media. The help desk will need to be able to communicate effectively and courteously with the wide range of stakeholders using the e-Manifest system.

The e-Manifest help desk will also be responsible for developing user guides and web tutorials to assist users. It is envisioned that these guides will be updated or delivered to the user community in advance of any system release. Once the system is operational, the help desk shall use its knowledge base to make suggestions on improving or adding to training, user guides, web tutorials, as well as areas of the system that may require additional attention. Based on the expected functions of the system, the help desk will need to have the following capabilities:

Tier 1

- Password resets
- User account maintenance
- Basic electronic manifest creation, transmission, and submission
- General questions about where to send paper manifests, data files, and images
- General questions about how to submit paper manifests, e.g., which documents to send
- Confirmation of known system tickets and any possible workarounds
- Data access and reporting
- Other paper documents received with the paper manifest
- Electronic signatures

Tier 2

- Fee questions
- Lost manifests

Tier 3

- Technical issues or glitches that require system or development changes
- Questions or comments regarding a new system release
- Issues identified by the paper processing center such as incorrect validation rules and issues with XML.

User Fee Proposed Rule

On July 26, 2016, EPA published its proposed e-Manifest User Fee Rule in the *Federal Register* (81 FR 49072). The July 26th proposed rule notice presents the Agency's proposed methodology for determining and revising e-Manifest-related user fees, as well as, the process for publishing its fee schedules to the user community over the course of implementing and operating the system. The proposed fee rule notice also discusses several non-fee proposals related to the use of the manifest and to corrections to manifest data. The discussion below summarizes the key elements and issues presented in the July 26th proposed rule notice.

Fee-Related Issues

1. *Which Users and Transactions Are Subject to Fees?*

With respect to the users subject to fees, the proposed rule tracks closely the definition of "users" prescribed by the e-Manifest legislation and by the implementing regulation of February 2014. Thus, the proposed Fee Rule methodology would first focus fee coverage on those members of the regulated community that are required to use the hazardous waste manifest under either federal or state law. The proposal to limit fee coverage in this manner was intended to focus user fees on the regulatory community who are the primary beneficiaries of an electronic manifest. There may be incidental system-related costs associated with other users' activities, e.g., state officials or members of the public accessing e-Manifest to obtain and consume manifest data, but EPA does not wish to impose fee obligations on these incidental beneficiaries of the system.

Second, the proposed rule would further refine the scope of e-Manifest user fees by limiting fee collection by EPA to the 400+ treatment, storage, and disposal facilities (TSDFs) that receive waste from off-site facilities for management. This proposed refinement of fee obligations is premised on the administrative efficiency of focusing fee collection on the TSDFs likely to benefit from the system, rather than establishing payment accounts and collection activities with 100,000+ generators. The decision to pass fee costs through to generator customers will le with the TSDF, but EPA would not assess fees to generators under the proposed rule.

Third, the proposed rule would clarify that the major "billable event" in e-Manifest would be the submission of the final copy of the manifest signed by the TSDF. The system would track and bill TSDFs for each final manifest submission. Other transactions subject to fees under the proposed rule are: (1) data correction submissions from TSDFs within the proposal's 90-day window post-receipt for finalizing manifest data, and (2) the sorting and return of stray or erroneous paper documents submitted with paper manifests. EPA concluded that these other transactions also merited fees because they would involve significant processing costs for the system, and they were identified by state officials as transactions that are frequently encountered in their tracking systems.

2. How and When Will Fee Payments Be Made?

The e-Manifest Act grants EPA discretion to require the payment of fees either in advance of the provision of manifest services, or as reimbursement for services provided. EPA explored both options with the regulatory workgroup and with stakeholders, and included two distinct options in the proposed rule notice for comment: (1) a monthly invoicing option, and (2) an advance, fixed payment option.

The proposed option is the monthly invoicing option, under which the Agency would bill each TSDF monthly for the actual manifest activity engaged in during the previous month. TSDFs would receive an electronic invoice displaying their manifest activity during the prior month, and TSDFs would be directed to Treasury's Pay.gov website to submit their electronic payments. Once directed to Pay.gov, TSDFs could make their payment using one of the electronic payment methods supported by Pay.gov. These methods include credit cards, debit cards, Automated Clearing House (ACH) debits from commercial bank accounts, PayPal, and Dwolla. Several TSDFs that were consulted indicated that this was the preferred option, as they believed that paying for actual usage on a monthly basis was the more precise and consistent with common commercial practices. However, the monthly invoicing option introduces a lag of perhaps two months between the time manifest services are used and the time when payments are received. The invoice would be sent after a month of usage has elapsed, and the TSDF would then be expected to make their payment within another 30 days of receipt of their invoice.

The alternative option presented in the proposed rule is the advance, fixed payment option. With this option, TSDF users would make a fixed payment on the first of each month. The monthly payment amount would be determined using an estimate of expected manifest usage for the year based on the number of manifests in the previous year. The prior year's manifest use numbers would be totaled by manifest type and divided by 12 to arrive at the estimate of monthly manifest usage. The monthly manifest fee would be calculated by applying the fee schedule amounts to the monthly manifest usage estimates. Once determined, the monthly fee amount to be paid to EPA would remain fixed for the entire year, and would be debited from the TSDF's bank account on the first of each month. The fixed payment feature was included so that this payment option would be consistent with the standards of Pay.gov for recurring periodic payments. The TSDFs that were consulted expressed skepticism regarding this payment option, because an estimated payment would not be as accurate as payments invoiced from actual usage. Also, there can be significant variability from year to year in manifest usage. Unless incentives were identified for this option, stakeholders stated that there would likely be resistance to automatic, estimated payments.

Under the alternative option, EPA would send one invoice to TSDFs at the end of each year to reconcile the amounts paid based on estimated manifest use against the actual manifest usage data. However, this option would involve a reduced volume of invoicing compared to monthly invoicing. The revenue stability risk posed by the 2-month lag inherent in monthly invoicing would be ameliorated by this alternative.

3. What Program Costs Are Fee Recoverable?

EPA's e-Manifest user fees must be set at levels that will ensure full recovery of all system related costs. To aid in the understanding of the proposed fee methodology, EPA grouped e-Manifest system-related costs across the three distinct categories below:

- **System Setup**: All system procurement costs, EPA's full-time equivalent (FTE), other IT and non-IT program costs dedicated to program development, and that are incurred prior to the operational date of the system;
- **Operations and Maintenance**: All contract and EPA's FTE and other IT and non-IT program costs dedicated to running and managing the e-Manifest program, and that are incurred after the operational date of the system; and
- **Indirect Costs**: The enabling and supporting costs not captured by either of the above categories, including buildings and utilities, overhead, rents, as well as FTE costs from other EPA offices outside the lead office, the Office of Land and Emergency Management (OLEM) and some portion of OLEM manager FTEs. The indirect cost would be determined by factoring the program's direct costs with an indirect cost rate that will be customized for the e-Manifest program.

4. What Formula Will Be Used to Calculate Per Manifest User Fees?

The centerpiece of EPA's fee methodology is the proposed fee formula that features a differential fee approach. The purpose of the fee formula is to allocate all the program related costs of e-Manifest across the various electronic and paper manifests that will be submitted to the system. The result of using the proposed fee formula is a per manifest fee that differentiates among the manifest submission types (fully electronic and paper manifests) based on the differing marginal labor costs of processing the

various manifest types into the system. EPA believes that the marginal labor costs of processing these manifests is the key distinguishing feature for determining the appropriate fees applicable to manifest submissions.

Electronic manifests are completely automated in their processing, so their marginal labor costs are minimal. There are, however, three distinct modes by which paper manifests may be submitted to the system: (1) submission of paper forms by postal mail, (2) uploading an image file produced from the paper form, and (3) uploading a paper form's associated data file (e.g., XML file) with an image file. The postal mail manifest submissions involve the highest marginal labor costs to process, as mail must be opened and sorted, data must be manually keyed into the system, and QA activities must occur. The image file upload mode presents intermediate marginal processing costs (no mail to open and sort), while the data file upload mode presents a fairly low marginal labor cost to process, since the data can be extracted and loaded to the system in a manner that is nearly as efficient as fully electronic manifests. EPA developed an economic model estimating these differing marginal labor costs, which are critical to the use of the formula to determine e-Manifest fees.

The proposed formula option focuses on the marginal labor costs as the key differentiating feature for manifest submissions during the initial four years of system operation. The labor costs involved with processing paper manifests are the highest costs associated with the establishment and operation of the paper processing center. The non-labor costs of the paper manifest processing center are shared equally by all manifests during this initial period of operation. However, the proposed fee formula includes a measure to reduce paper manifest submissions– the formula becomes more aggressive (elevating fees) if those submissions are not able to transition to fully electronic manifest use at a level of 75% after four years of system operations. If 75% of paper manifests are not converted to electronic manifests by year four, the fee formula would adjust so that paper manifests would bear the burden of all non-labor costs of the paper processing center. From this point forward, there would be no subsidization of any paper manifest costs by electronic manifests. EPA believes that this proposed formula adjustment will provide a means to encourage transition from paper manifests to data file uploads from paper forms, and ultimately, to fully electronic submissions.

5. How Does the Proposed Rule Address Fee Revisions?

The July 26th Fee Rule proposal recognizes that the fee schedule must be able to respond nimbly to e-Manifest program cost changes. Therefore, EPA is proposing to update the e-Manifest user fee schedule every two years to align fees more closely with changes in program costs. Since the fees determined by the proposed fee formula are most sensitive to the magnitude of program costs and the number of manifests in use, fee revisions would be accomplished by recalculating the fee formula every two years using the most recent program costs and manifest use numbers. Since the normal two-year cycle for fee schedule revisions would rely upon the pre-established fee setting formula and methodology (only the program costs and manifest numbers would change), the fee revisions would be announced through the program's website, and not by a notice-and-comment regulatory process. EPA believes that this proposed two-year revision cycle, with publication of fee revisions to the program's website, represents a reasonable accommodation of fee stability, fee accuracy, administrative burden, and response to change.

EPA has included in the proposed rule two fee adjusters. The first is a simple inflation adjuster that would reference the Consumer Price Index (CPI) and adjust fees between the first and second year of

each cycle to reflect inflation. EPA recognizes that inflation has been minimal in recent years, but as the fee methodology must be durable over time, EPA believes that the inclusion of an inflation adjuster to fees is appropriate.

The second adjuster would operate between the two-year fee cycles to recapture any revenue losses to the program on account of either imprecise estimates of manifest numbers in use, or manifests for which the fees assessed were uncollectable because of non-payment by the responsible party. Particularly at the outset of e-Manifest deployment, the program is relying heavily on estimates regarding manifests in use to set fee schedules. In time, as EPA operates the system and can monitor precisely how many manifests are being submitted annually, the numbers of manifests and the resulting fees will become more precise. Since the manifest numbers in use are a key factor in the formula, and revenue sufficiency depends heavily on the accuracy of these figures, EPA believes it will be useful to have an adjuster in the formula to accommodate shortfalls or surpluses that result from any imprecision in the estimated manifest use numbers. Likewise, the proposed rule includes an uncollectable manifest adjuster so that any revenue losses in a prior cycle resulting from the failure of a facility to pay its assessed fees can be added to the program costs in the new fee cycle to recapture system costs.

6. What Sanctions Are Proposed for Non-Payment of Fees?

EPA must ensure the sufficiency of fee revenues to cover system program costs. Therefore, EPA is reliant on prompt payment of fees by the responsible parties to maintain adequate revenue. Thus, the proposed rule includes sanctions as a means to ensure prompt payment of fees.

- The first tier of sanctions is based on financial penalties that already exist under a federal claims collection statute at 31 U.S.C. 3717. If a user fee payment becomes 30 days past due, an interest sanction results, and interest will be charged at the Combined Value of Funds Rate (currently 1%). Should payments remain past due for 90 days or more, an additional financial penalty of 6% would be imposed, also based on federal claims collection authority.
- The second tier of sanctions is initiated when user fee payment remains past due for 120 days or more. At this stage of delinquency, the name of the delinquent payor would be published in a Delinquent Payors List maintained on the program's website. The inclusion of this sanction is premised on the view that users will want to avoid such negative publicity, and the potential for such publicity will deter users from allowing their payments to be in arrears.
- The final tier of proposed sanctions includes the availability of a RCRA civil compliance order for non-compliance with a new requirement for completion of manifests. This proposed regulation would state that a submitted manifest is not fully complete unless all fees arising from the submission or correction of the manifest have been fully paid. Thus, at the discretion of the Agency, failure to make full and timely fee payments could give rise to a civil enforcement order imposing a civil penalty or ordering payment of fees owed.

EPA did not explicitly propose, but requested comment on, two additional sanctions. EPA is requesting comment on whether, and under what conditions, it might be appropriate to impose a denial of services sanctions for fee payments that are egregiously delinquent, or in such cases, to impose a sanction that might suspend a facility's authorization to continue managing hazardous waste. These two additional sanctions are severe, but it would be useful to have comment and discussion on whether there is a role for such severe sanctions and the circumstances warranting them.

Advanced, Fixed-Payment Method

The following section will provide additional guidance and information related to questions posed to the Advisory Committee[12].

The e-Manifest Act grants EPA broad discretion to collect fees in advance or as reimbursement services for both electronic manifests and paper manifests that continue in use. EPA must institute a fee collection process that facilitates prompt payment of fees to ensure that the agency produces a stable revenue stream that will recover program development and operational costs in full. EPA has considered several options to address how the e-Manifest system can most effectively and efficiently collect a large number of small value fees from TSDFs. As explained in the proposal, EPA believes the pre-payment options are advantageous, from an administrative perspective, because they would allow for the collection of fees in advance of manifest services. Such an approach could also provide a more stable revenue stream to cover system costs throughout the year, because of the nearly automatic, scheduled nature of the payments. This feature of the advanced payment option could also generate revenue more promptly for the initial year of system operations.

Assuming that EPA receives adequate funding in fiscal years 2017 and 2018, the agency anticipates that the e-Manifest system will be operational in June 2018. At that time, EPA will transition to a fee collection system, and the majority of appropriated funds for e-Manifest in fiscal year (FY) 2018 will be used for operating and maintaining a paper processing center and IT help desk. These costs will be recovered through fees, but EPA anticipates that a cash flow issue may arise as the system transitions from the development to fully operational stage. The advance, fixed payment approach would facilitate EPA's ability to promptly pay for its system-related expenses and reduce the revenue stability risks posed during the first year of operation and by late or non-payments. In addition, the inherent revenue vulnerability of the monthly invoice option proposed in the User Fee Proposed Rule could delay receipt of funds needed to manage the system during the first year of operation.

EPA is exploring several means by which it could minimize the revenue stability issue in the initial year of operation. EPA is pursuing funding for e-Manifest implementation through the budget process, and ideally, there would be sufficient funds appropriated to cover several months of operating expenses. Nevertheless, funding prospects for FY 2018 are unknown, and EPA needs to be prudent in planning for other means to provide stable revenue.

However, the advance payment options would entail a greater administrative burden on the back-end of the collection process, because of the necessity to bill or invoice users at the end of the year for a reconciliation payment to square actual usage with estimated payments, or to process a credit in the case of overpayments. If users do not monitor their monthly payment records and track closely their actual manifest usage levels over the course of the year, disparities could develop that might produce unexpected billing amounts or possibly disputes at the end of the year.

Finally, the monthly advance payment option has the advantage of harmonizing with the fixed, recurring electronic payment option supported by Treasury through Pay.gov. Currently, a recurring monthly payment to Pay.gov can occur as an ACH electronic payment, but only if the recurring monthly payment is for a fixed amount. EPA has aligned the advance monthly payment option, with its estimated monthly

[12] See attached document: *e-Manifest Advisory Board Charges*

payment calculation, with the Pay.gov fixed recurring payment approach in order to take advantage of the nearly automatic nature of this specific electronic payment process.

In consultation with industry representatives, the Agency learned that the representatives generally favor the invoicing approach to the advance payment options. The industry representative members advised that there are variations in manifest usage from year to year, and billing for actual usage avoids the imprecision of estimate fees based on a previous year usage. Industry representative members did indicate that with respect to advance payments, that option could be more attractive if the advance payments were paid monthly rather than as a lump sum, and if there were incentives (e.g., cost savings) tied to using this method.

EPA discussed and solicited comment on an advance monthly payment option and an alternative option that combines the monthly invoicing and advance fixed payment approaches. Under the monthly advance payment approach, EPA would charge TSDFs fixed one-twelfth payment amounts on the first of each month, with the payments occurring as a pre-authorized ACH debit from a facility's commercial account. TSDFs would be expected to self-declare the number of manifests they expect to use (based on prior year usage) on an online fee calculation form provided by EPA. Facilities would allocate their manifest usage as either electronic or paper manifests. In addition, TSDFs would divide their annual use projections by twelve to calculate the number of electronic and paper manifests projected per month. The appropriate monthly fee for electronic and paper manifests would be calculated, and from this calculation, the recurring monthly debit amount would be determined. EPA would either credit TSDFs for overpayment (if their actual usage was less than predicted), or invoice facilities at the end of the year for any underpayment identified during the reconciliation process, should actual usage exceed the estimates based on the previous year's usage.

EPA solicited comments on an alternative option to the monthly advance payment approach. The alternative option is a combination of the proposed monthly invoicing and monthly advanced/fixed payment approaches. Under this option, EPA would initially invoice TSDFs in the first year (or longer period) based on their actual monthly manifest usage. EPA acknowledged in the proposed rule there are uncertainties with regard to manifest usage rates and the numbers of electronic and paper manifests in use to assure with confidence that the advance payment approach is the method of choice during the initial period of system operations. However, after more inquiry into facilities' actual manifest usage, EPA believes these concerns would diminish over time. Therefore, EPA requested comments on an approach to fee collections where, after conducting monthly invoicing for the initial year (or other period) of system operations, the Agency would transition users to the use of payment plans enabling facilities to authorize a debit from a commercial account of a fixed, monthly advance ACH payments. This alternative is premised on the assumption that developing a baseline of manifest usage data from a year or more of invoice activity would be helpful in projecting future manifest usage, and that such information would be sufficient to develop estimated monthly payments under an advance fixed payment method. Any deviation between projected and actual usage and fees would be addressed by the end-of-year reconciliation process.

Finally, EPA proposed to implement e-Manifest user fee payments, at least initially, by invoicing users monthly for their actual manifest usage activity in the prior month. EPA acknowledged the advantages to billing monthly for actual usage, rather than for estimated usage from prior years' activities, and that this proposal would result in revenues matching system activity by users more precisely.

OLEM's Hybrid Manifest Proposal and Phase-in of Electronic Manifesting

e-Manifest is motivated by a desire to eliminate inefficiencies with paper manifests and to improve the management of manifest data at the national level. The achievement of a "paperless" manifest has been a stated goal of the program, despite the existence of impediments to a fully electronic system. For example, the Department of Transportation (DOT) still requires that one hard copy of the hazmat shipping document be carried in a particular location on transport vehicles to facilitate emergency response. Further, it is understood that it might be challenging to access internet and electronic documents in geographically remote hazardous waste generation sites. It is also understood that paper manifests may still be a necessary "backup" to enable commerce of hazardous waste shipments to continue when the e-Manifest system is down or otherwise inaccessible.

EPA has struggled with the question of whether an electronic manifest can supplement or co-exist with a paper manifest that captures information about one or more segments within the chain of custody of the same hazardous waste shipment. Ideally, all facets of a waste transaction would be captured electronically, but in certain cases, this might not be achievable. In such cases where the waste handler (i.e., the generator, initial transporter) is unable to prepare the manifest electronically and must resort to paper, can other segments of the waste transactions be transmitted electronically? Alternatively, should the electronic manifest be (initially) limited to the last transaction (TSDF receipt and submission), while the tracking of the waste shipment from the point of generation-transportation-destination transactions be captured on paper manifests?

In the February 2014 One Year Rule, EPA resolved these questions against allowing partial electronic and partial paper tracking of the same waste shipment transaction. The final One Year Rule determined that the electronic manifest format could be used for waste shipment tracking only when it was known at the outset that all waste handlers named on the manifest could participate electronically (February 7, 2014; 79 FR 7518, 7549). In reaching this determination, EPA concluded that there would be too many additional manual entries and steps required of waste handlers to preserve a complete record or full accounting of the waste shipment in these mixed manifest scenarios. For example, EPA earlier considered approaches whereby sufficient paper copies would be prepared to include the pertinent waste and handler information and to include the tracking number assigned to the shipment by the e-Manifest system. These paper copies would be signed in ink and retained by handlers not able to participate electronically, and these paper copies would be marked up further with information about the person signing, the date of signature, and the notation "signed electronically" to indicate that the execution of signatures by handlers participating electronically. Moreover, it was believed that in order to sustain this model and provide full accountability, receiving facilities would need to submit both electronic and paper copies to the system, requiring further effort by the system to merge these records and retain a complete record of the waste shipment bearing all the ink and electronic signatures (79 FR 7518, 7550). After considering the various steps and processing measures that hybrid manifests would require of both handlers and the system, EPA concluded in the final One Year Rule that the burden of processing mixed or hybrid manifests in this manner would offset any savings that would be realized from a partial electronic tracking of the waste movement (79 FR 7518, 7550). The Agency concluded that an all or none approach to electronic manifesting was more straightforward to implement and would avoid the confusion and perhaps compliance challenges of mixing paper and electronic tracking for the same shipment.

However, for the proposed Fee Rule, EPA was most concerned with the significant implementation challenges that e-Manifest would pose for certain generators. Principal among these challenges were the likelihood of remote generation sites lacking access to e-Manifest, necessitating off-line signatures and processing. EPA was also concerned with the additional challenges for generators to meet EPA's electronic reporting requirements under CROMERR. Among these CROMERR challenges were: (1) the necessity of registering, (2) identity-proofing thousands of generator employees with manifest preparation and signing responsibilities, and (3) the execution of CROMERR-compliant electronic signatures with two-factor authentication and CROMERR's reliance on passwords and personal challenge questions as signature methods, creating challenge/response gauntlets which could be daunting for many small generators (who ship wastes infrequently) to pass. Generators must also comply with certain "copy of record" requirements under CROMERR, requiring generator signatories to receive a notification and provided an opportunity to repudiate each manifest transaction attributed to them within a reasonable time.

Because of these concerns, EPA re-opened the question of allowing mixed paper and electronic manifests in limited circumstances to complete and sign the generator's initial copy of the manifest. Our concern in the proposed Fee Rule notice was that a policy banning all mixed manifests, without exception, could be too restrictive and might rule out much-needed flexibility at generator sites where a phase-in of electronic manifesting could be beneficial.

Therefore, in the proposed Fee Rule notice, EPA proposed for public comment an approach relaxing the hybrid manifest ban in the limited circumstance of hazardous waste generators (see Figure 2). The proposal would allow generators to choose to complete and sign a paper manifest in the conventional manner, to obtain the ink signature of the initial transporter at the time the transporter acknowledges its receipt, and to retain this ink-signed paper copy among its records as the initial generator copy of the manifest. For the generator, the manifest would operate exactly as it does today in the paper world. However, subsequent handlers would be presented with the electronic manifest carried on portable devices, and transporters and the receiving facility would execute the manifest with their electronic signatures. The final copy signed electronically by the receiving facility would be submitted to the system and retained as the shipment copy of record, while the initial generator copy would remain as a paper copy at the generator site.

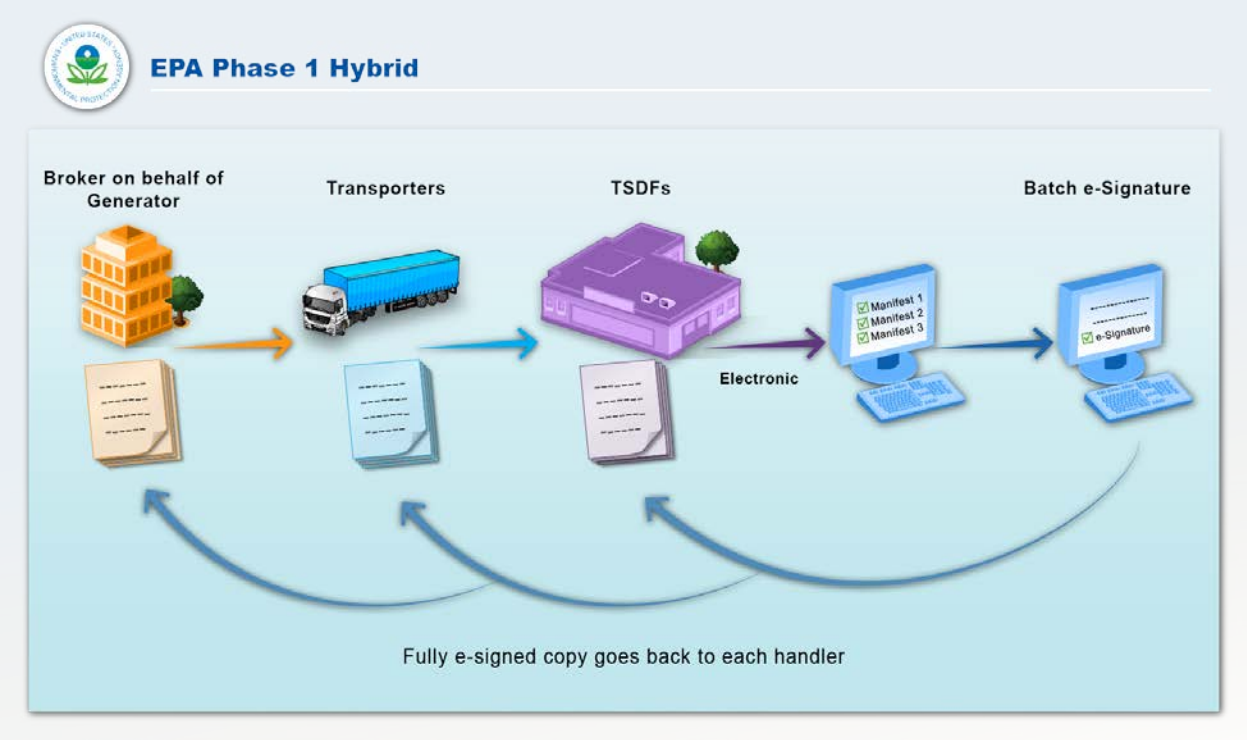

Figure 5: Phase One Paper-Electronic Hybrid Approach

EPA recognized that this proposed option might involve some of the difficulties that were rejected in the One Year Rule by allowing a paper copy to remain at the generator site, severed from the electronic version that continues in play, and that may undergo editing while the shipment continues to the receiving facility. However, given the substantial challenges faced at generator sites in the initial implementation of e-Manifest, EPA believed there is merit in this option as it would enable many of the desired efficiencies and burden reductions of electronic manifesting to occur for handlers beyond the initial generator (July 26, 2016; 81 FR 49072, 49100). With the exception of the initial generator copy left at the generator site, the electronic copy certified by the TSDF would be submitted to the system and managed as the copy of record for the transaction and accessible to the states and other interested handlers through the system.

The proposed rule would create an exception to the mixed manifest ban at 40 CFR §262.24(c)(1) to enable a generator only to sign by hand and retain a paper copy signed by hand by the initial transporter for its records. Others in the chain of custody would still be expected to participate electronically. EPA requested comment on this proposed hybrid option. The Agency further asked commenters:

- If there were other scenarios that might benefit from hybrid manifest flexibility
- If commenters agreed that the generator site scenario is a good candidate for the proposed relief
- If the proposed hybrid option could be implemented with simplicity, thus avoiding the complexity, burden, and compliance issues we posited in the One Year Rule as justification for

the earlier ban of mixed manifests; if so, we asked commenters to explain how this could be done[13].

Non Fee-Related Proposals

EPA included additional non-fee related regulatory proposals in the proposed Fee Rule. They affect the flexibility of the manifest in specific situations, and the process for making changes to manifest data.

Transporter regulation. EPA has proposed a regulatory amendment that would allow the addition or substitution of a hazardous waste transporter and thus alter the routing of a waste after the shipment is en route. Existing requirements only permit the routing of waste to be changed when an emergency (e.g., fire, flood, closure) requires the routing to be altered, and then, only after consultation with the generator on the change. The proposed amendment to the transporter requirements would allow the addition or substitution of another transporter in cases of emergency or for transporter efficiency. Such a change could be executed either by consultation with the generator, or pursuant to a contract designating the initial transporter as an agent to make such a routing change on behalf of the generator.

Facilities and Manifest Corrections. EPA is proposing that TSDFs are responsible for completing corrections to previously submitted manifest data within 90 days of hazardous waste receipt. The intent is to synchronize this requirement to correct and finalize manifest data within the same 90-day window, as announced in the February 2014 One Year Rule, where manifest data is not publicly available.

All changes must be made electronically by the TSDFs, and the submission must contain a signature certifying that the changes will render the data accurate and complete. The changes may be executed in piecemeal fashion (submitted as edits are made to each manifest) or as a batch submission. States and other parties affected by the change will be notified of the proposed change and will be afforded an opportunity to comment, but the correction process must be completed by the facility within 90 days of waste receipt.

Data changes may also be initiated by a notice of an error provided to the facility by either a state or by an interested party. There are time limits imposed on the TSDF to respond to the error notice with a correction or by affirming the original data. Interested parties and states may respond to any correction submitted by the TSDF as a result of the error notice. In any case, all comments must be reconciled, and the final corrections must be submitted by the TSDF within the 90-day period for data finalization prior to public disclosure.

[13] See attached document: *User Fee Rule Comment Summary*