

Modernization of the Tank Waste Information Network System (TWINS)

Presented for the EM Waste
Processing Technical Exchange

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- History
- Components
- Original Design
- Mission
- Identified Issues
- Improvements to Software and Hardware
- Benefits
- Q & A



- Created in 1992 as a tool to aid in safety
- Peak staff/budget in 2000
- By 2008, effort to keep software interface current was limited
- Updated TWINS with new features / removed out of date features / fixed problems

- Tank Characterization Data
- AutoTCR and Reports
- Best-Basis Inventory
- Document Repository
- Transfer Data
- Historical Data for Tank Temperature, Surface Level, Pressure, etc.



- Primary use was for waste characterization and sampling
- Intended to make waste content information available to the public
- Contained an electronic document repository
- Numerous automated tools – the AutoTCR tool alone was composed of two separate databases and over 60 automated scripts and procedures



- At peak of mission, provided characterization for sampling events to staff of 20+ people
- Maintained by 3+ full time programmers and a full time data entry clerk
- Automated tools generated characterization reports upon demand and emailed results directly to user



- By 2008, characterization had reduced to five primary users, with only a half-time PNNL staff member supporting the system
- Focus had narrowed to only new sampling events
- Most information became available from other sources



- More modern tools allowed users to locate the same information elsewhere.
- Of all the AutoTCR tools, only the means and confidence interval tables were being used regularly; almost everything else was being used once a year
- Best-Basis Inventory was the other tool being used regularly
 - The text of Best-Basis Inventory Reports was available elsewhere, and much easier to access
 - Best-Basis Inventory updated much more frequently



- The growing size of AutoTCR reports strained the capabilities of email to provide reports.
- The events of 9/11 resulted in TWINS information being restricted to DOE employees and Hanford site contractors only
- Hardware upgrades were excessively costly – A single server was upgraded yearly, and forced development staff to recompile software to match new hardware.



- Physical Server running AutoTCR was failing
 - Complete System Crashes occurring every 2-3 days
 - Required manual resets daily
- The cost of replacing physical hardware or moving the software to a new server was prohibitively high.



- The decision was made to remove AutoTCR from TWINS
 - All existing data was captured in issued reports as record information
 - Best Basis Inventory information was removed from the AutoTCRs and issued as it own report



- Document Repository completely renovated with user friendly interface
 - Existing interface often required half a day to upload a single file to the server
 - Only the current tank characterization and Best-Basis Inventory reports are available to internal users and external visitors; older reports were moved to our integrated document management system
 - Document Repository site was rewritten in ASP.net 3.5 making maintenance much simpler and cheaper



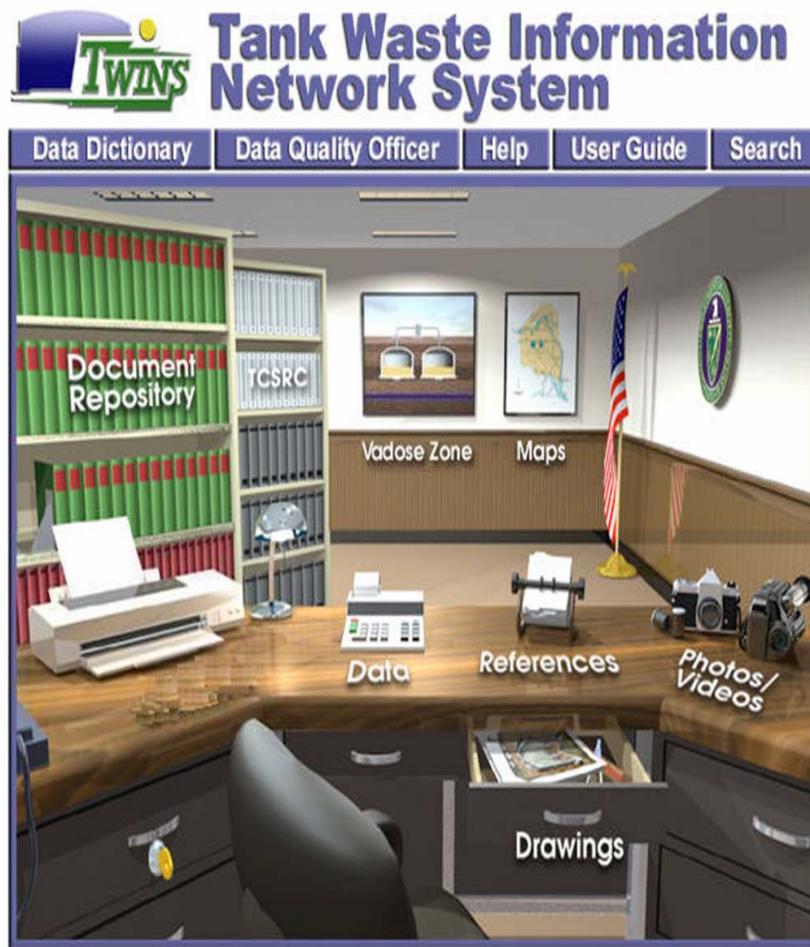
- Server hardware replaced entirely, with configuration management plan in place to upgrade at the end of warranty, every 6 years
 - Avoids expensive development costs normally incurred with piecemeal integration of hardware
 - Stable platform allows better planning and performance of potential features

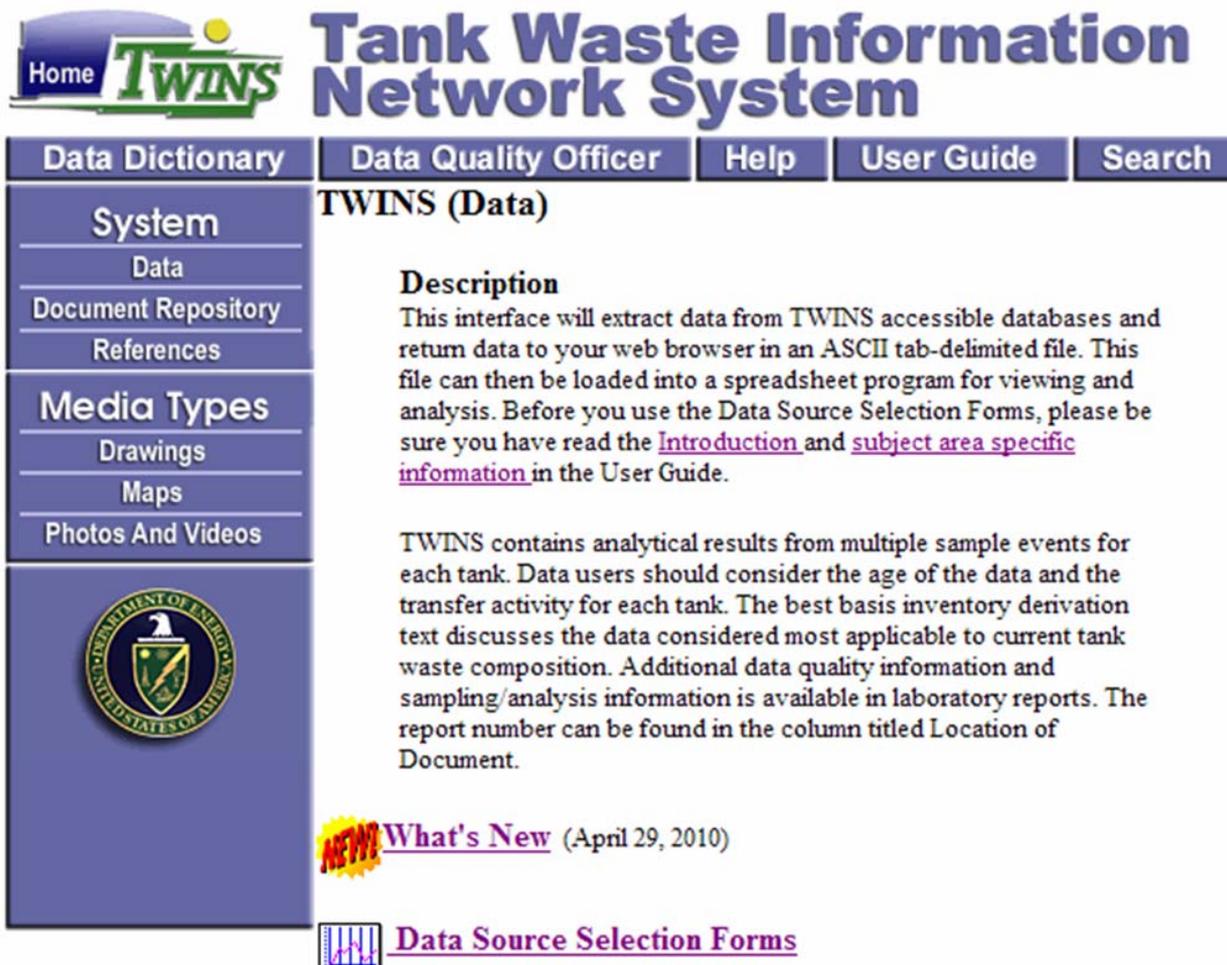


- Documentation
 - Software Quality Assurance documentation updated to reflect changes and new mission focus.
- Maintenance
 - Revised software now easily supported by a single part-time developer
 - Hardware upgrades standardized, drastically reducing cost (\$1M yearly, vs \$600K over FY09 and FY10)



- Improved User interface
 - Information in repository can be browsed by tank; no search required
 - User interface for adding and removing documents modernized; process takes seconds and requires no special tool.





The screenshot shows the TWINS (Data) web interface. At the top left is a 'Home' button and the TWINS logo. To the right is the main title 'Tank Waste Information Network System'. Below the title is a navigation bar with buttons for 'Data Dictionary', 'Data Quality Officer', 'Help', 'User Guide', and 'Search'. On the left side, there is a vertical menu with categories: 'System' (containing 'Data', 'Document Repository', 'References'), 'Media Types' (containing 'Drawings', 'Maps', 'Photos And Videos'), and a large blue box containing the Department of Energy logo. The main content area is titled 'TWINS (Data)' and contains a 'Description' section. The description explains that the interface extracts data from TWINS accessible databases and returns it as an ASCII tab-delimited file. It also includes a 'What's New' section dated April 29, 2010, and a link to 'Data Source Selection Forms' with a small bar chart icon.

[Home](#) **TWINS** **Tank Waste Information Network System**

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TWINS (Data)

Description
This interface will extract data from TWINS accessible databases and return data to your web browser in an ASCII tab-delimited file. This file can then be loaded into a spreadsheet program for viewing and analysis. Before you use the Data Source Selection Forms, please be sure you have read the [Introduction](#) and [subject area specific information](#) in the User Guide.

TWINS contains analytical results from multiple sample events for each tank. Data users should consider the age of the data and the transfer activity for each tank. The best basis inventory derivation text discusses the data considered most applicable to current tank waste composition. Additional data quality information and sampling/analysis information is available in laboratory reports. The report number can be found in the column titled Location of Document.

NEW! [What's New](#) (April 29, 2010)

 [Data Source Selection Forms](#)



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Data (Source Selection)

Notice

The data and information flagged TPA in this database are post-1989 analytical data and are recognized by the Washington State Department of Ecology for use in Tri-Party Agreement (TPA) and regulatory documents.

Subject Areas

Best Basis Inventory ▶

Measurements ▶

Sample Analysis ▶

Source Term ▶

Tank Transfers ▶

Vapor ▶

Best-Basis Inventory Notice

The best-basis inventories are updated quarterly based on new sample data, waste transfers and reconciliation efforts. Refer to the BBI Change Control Status for a list of pending and approved changes to the best-basis inventory data set. The standard BBI analytes include 25 chemicals and 46 radionuclides. Radionuclides are decay-corrected to January 1, 2008. Inventories for other analytes, including free hydroxide, may be found in the Best Basis Calculation - Supplemental Analytes report.





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Subject Areas

- Best Basis Inventory**
- Measurements
- Sample Analysis
- Source Term
- Tank Transfers
- Vapor

Inventory estimates for 25 chemical and 46 radionuclide constituents in each of the 177 double and single shell underground waste storage tanks

Best-Basis Inventory Notice

The best-basis inventories are updated with tank transfers and reconciliation efforts. Reference to pending and approved changes to the BBI analytes include 25 chemicals and 46 radionuclides corrected to January 1, 2008. Inventories may be found in the Best Basis Calculation Detail - Supplemental Analytes

- Best Basis Calculation Detail
- Best Basis Calculation Detail - Supplemental Analytes
- Best Basis Calculation Detail - Miscellaneous Tanks
- Best Basis Summary
- Best Basis/TCR Tank Inventory
- Change Control Status

a, waste
for a list
the standard
decay.

Best Basis Inventory
Historical Information
provided for reference



Tank Waste Information Network System

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Contains data from the Surveillance Analysis Computer System (SACS) located in the 200 Area at Hanford

SACS

Retrieve data directly from the SACS database.

- Interstitial Liquid Level
- Surface Level
- Tank Temperature Readings

Best-Basis Inventory Notice

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Modernization of TWINS



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Data obtained from laboratory data package reports on a per-tank basis

Best-Basis Inventory Notice

The best-basis inventories are updated on a regular basis to reflect tank transfers and reconciliation efforts. Reference to pending and approved changes to the Best Basis Inventory (BBI) analytes include 25 chemicals and 40 radionuclides corrected to January 1, 2008. Inventories may be found in the Best Basis Calculation

- Constituent Groups
- Data Change Log
- Data Loading Summary
- Historical Analytical Data
- Sample Description
- Sampling Event Data

Tank Results RPP 241

Consolidated

Modernization of TWINS



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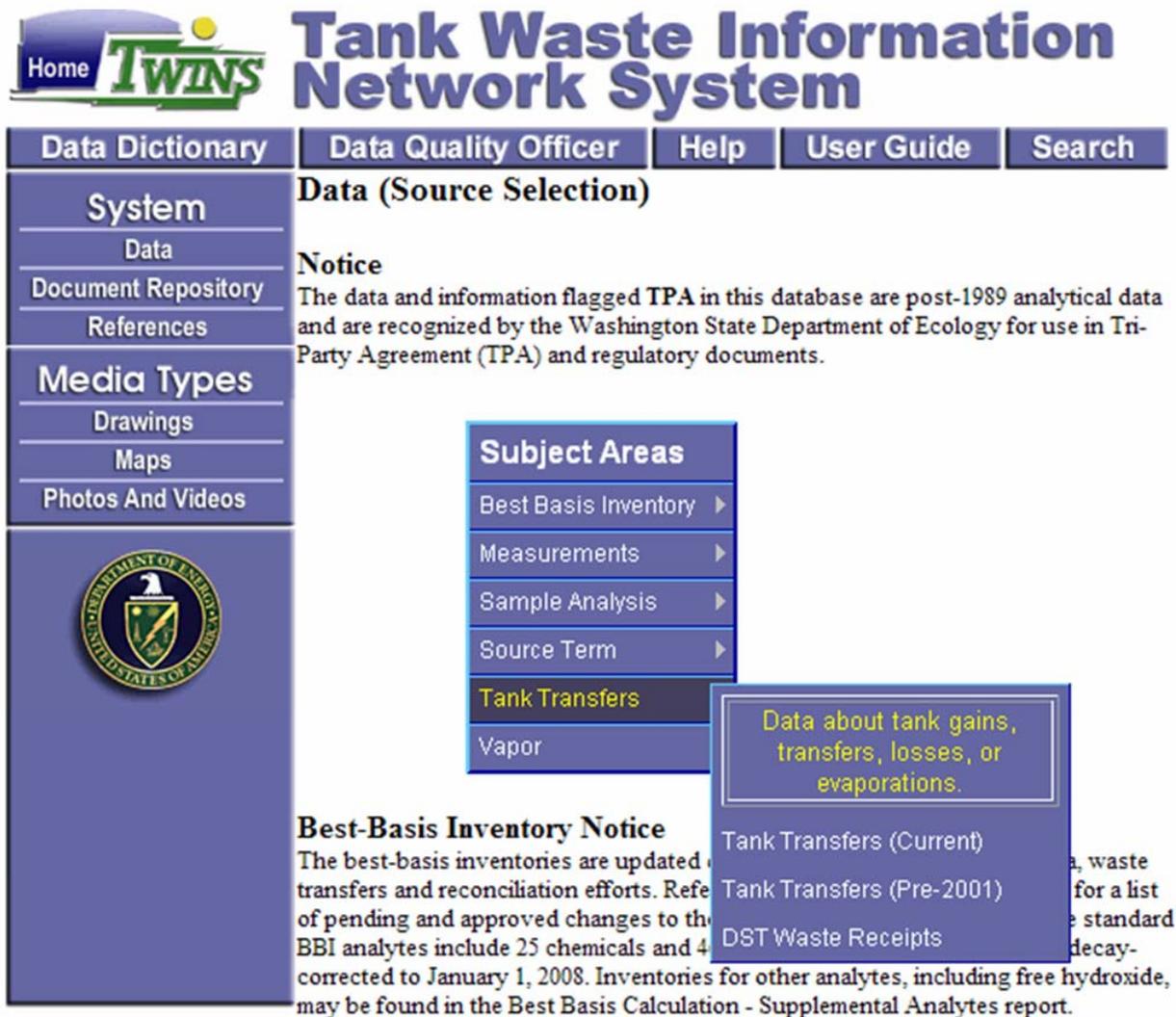
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Subject Areas

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- Measurements ▶
- Sample Analysis ▶
- Source Term
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- Vapor

Radiological source term (Unit Liter Dose) and toxicological source term (sum of fractions) estimates for use in safety analysis calculations. Estimates are provided for each of the 177 single and double shell underground waste storage tanks based on the most current BBI

Best-Basis Inventory Notice
The best-basis inventories are updated with transfers and reconciliation efforts. Reference of pending and approved changes to the BBI analytes include 25 chemicals and 4 corrected to January 1, 2008. Inventories may be found in the Best Basis Calculation



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Data about tank gains, transfers, losses, or evaporations.
 Tank Transfers (Current)
 Tank Transfers (Pre-2001)
 DST Waste Receipts



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Best-Basis Inventory Notice

The best-basis inventories are updated for tank transfers and reconciliation efforts. Reference to pending and approved changes to the BBI analytes include 25 chemicals and 4 methods corrected to January 1, 2008. Inventories may be found in the Best Basis Calculation

- Tank headspace characterization data
- Headspace Sample Analysis**
- Industrial Hygiene
- Sampling and Analytical Methods
- Compound Groups
- Analysis Results
- Averaged Reported Values
- Sampling Event Data
- Sample Reference Relation

Modernization of TWINS



TWINS > Tank Reports

TWINS Tank Reports

A Tank Farm	AN Tank Farm	AP Tank Farm	AW Tank Farm	AX Tank Farm	AY Tank
241-A-101	241-AN-101	241-AP-101	241-AW-101	241-AX-101	241-AY-101
241-A-102	241-AN-102	241-AP-102	241-AW-102	241-AX-102	241-AY-102
241-A-103	241-AN-103	241-AP-103	241-AW-103	241-AX-103	
241-A-104	241-AN-104	241-AP-104	241-AW-104	241-AX-104	
241-A-105	241-AN-105	241-AP-105	241-AW-105		
241-A-106	241-AN-106	241-AP-106	241-AW-106		
	241-AN-107	241-AP-107			
		241-AP-108			

AZ Tank Farm	B Tank Farm	BX Tank Farm	BY Tank Farm	C Tank Farm	S Tank I
241-AZ-101	241-B-101	241-BX-101	241-BY-101	241-C-101	241-S-101
241-AZ-102	241-B-102	241-BX-102	241-BY-102	241-C-102	241-S-102
	241-B-103	241-BX-103	241-BY-103	241-C-103	241-S-103
	241-B-104	241-BX-104	241-BY-104	241-C-104	241-S-104
	241-B-105	241-BX-105	241-BY-105	241-C-105	241-S-105
	241-B-106	241-BX-106	241-BY-106	241-C-106	241-S-106
	241-B-107	241-BX-107	241-BY-107	241-C-107	241-S-107
	241-B-108	241-BX-108	241-BY-108	241-C-108	241-S-108
	241-B-109	241-BX-109	241-BY-109	241-C-109	241-S-109
	241-B-110	241-BX-110	241-BY-110	241-C-110	241-S-110
	241-B-111	241-BX-111	241-BY-111	241-C-111	241-S-111
	241-B-112	241-BX-112	241-BY-112	241-C-112	241-S-112

Modernization of TWINS



- Visit <http://twins.pnl.gov/twins.htm> to see the website

Contact Information

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