Version History of QUAL-TX for Windows

9.35 - a) Add nonpoint source loadings for salinity, conservative material #1, and conservative material #2
b) Implement a program switch to allow batch run without the GUI interface
c) Implement batch mode to allow the user to supply an input file name on the command line
d) Correct issue with PO4 nonpoint source loading
e) Correct some loading table issues
f) Add additional sensitivities.
9.34 - a) correct error in loading report when reach is not being modeled (i.e., initial temp = 0)
b) correct issue with saving loading report preferences
9.33 - a) increased maximum number of dams from 20 to 30
b) fix river distance formatting on plots
9.32 - a) added additional error checking information for reach id cards (Data Type 8)
9.31 - a) increased number of allowable stations in overlay from 50 to 80
b) added nonpoint input for NH3, NO3, PO4, and associated sensitivities
c) fix line wrapping in rich-text output
9.30 - a) corrected error in calculation of constituent CM-2 related to wasteloads (error originated in LA-QUAL v.9.10)
b) added sensitivities for dam coeffiecients
c) corrected labeling of plot legend when displaying multiple sensitivity parameters per set
9.29 - a) added additional information concerning warnings
b) added HELP menu item to access Users Manual
9.28 - a) added additional error checking information
b) corrected issue with preferences for labeling of filename on plot
c) corrected issue with effective concentration adjustments when chlorophyll a is included in headwaters
d) added table to show adjustment of concentrations when using effective concentrations
9.27 - a) added additional error checking and method for reading legacy overlay cards
9.26 - a) add rich-text file format option to output report
9.25 - a) corrected input echo in output report for dispersive hydraulic parameters (HYDR-2)
9.24 - a) added additional error checking for plot cards (Data Type 30)
b) increased number of allowable reaches per RCH card to 40 (Data Type 30)
c) added ability to show tributary locations on plots
d) added ability to specify different programs for viewing and editing
9.23 - a) corrected display issue in the File dialog menu when more than 9 files had been opened
9.22 - a) corrected issue with reading HDWTR-2 values in sequenced files
b) added additional error checking for overlay cards
c) corrected dimensioning of RSENS from MXH to MXR
9.21 - a) made some unit conversions more precise
9.20 - original version of QUAL-TX for Windows

Modifications that were made during the development of QUAL-TX for Windows from LA-QUAL v. 9.14:

1) Added evaporation component to hydraulics.
2) Default of .inp extension added to open list options.
3) Corrected problem with width going negative during flow reversals
4) Corrected some sensitivity problems (incorrect array dimension; crashed when mixing 1 and 2 columns per set)
5) Added option to KTIDE to set all dispersion to 0
6) Added salinity to loading table
7) Added additional tidal information to final report

Modifications that were made during the development of LA-QUAL v.9.14 from QUAL-TX v. 3.4:

1) Conformance of the core code to American National Standard Fortran 90 (ANSI X.198-1992) and International Standards Organization standard ISO/IEC 1539-1991(E).
2) Development of a Windows graphical interface.
3) Development of on-screen graphic output showing predicted profiles and observed data.
4) Development of on-screen graphic output for sensitivity analysis
5) Allowing hydraulics to be based on width/depth input in addition to velocity/depth input.
6) Allowing settling rates to be input on a per day basis in addition to a settling velocity basis.
7) Addition of new reaeration equations.
8) Addition of low dissolved oxygen concentration inhibition for NCM decay rates.
9) Corrections to certain errors in coding related to reaeration rate equations, settling rates, and effective BOD in lower boundary

conditions.
10) Corrections to certain errors in coding related to the coliform temperature correction theta, the NCM oxygen inhibition technique, and nonconvergence problems
11) Corrections to the Owens-Edwards-Gibbs reaeration equation in option 4 of Data Type 12 (<5fps, 1964).
12) Addition of a Special Report Sensitivity Table.
13) Modifications to the format for many of the fields in the capsule summary, intermediate report, and final report.
14) Added extra error detection in input
15) Added shelter coefficient for wind driven reaeration
16) Added dam capability
17) Corrected problems with English/Metric option
18) Added inhibition to organic nitrogen for use as NBOD
19) Added BOD#2 constituent
20) Added sensitivity factors for non-point source
21) Added ability to specify oxygen inhibition equations for each inhibited constituent
22) Added ability to specify oxygen threshhold in equations for each inhibited constituent
23) Added dispersion through headwater to allow second boundary condition
24) Added ability to allow comments in input and overlay files
25) Corrected initialization of certain LBC concentrations
26) Added additional options for nutrient limitations
27) Added option to calculate dispersion as a function of mean velocity
28) Increased allowable sensitivities to 100
29) Added sensitivities LBC Salinity, Wind Velocity, Pressure, Dry Bulb Temp, Wet Bulb Temp
30) Made major changes to temperature simulation
31) Added ability to exclude specific wasteloads for WSL FLOW sensitivities
32) Added ability to exclude specific headwaters for HDW FLOW sensitivities
33) Added ability to change temperature equation for atmospheric attenuation
34) Added ability to change temperature equation for atmospheric longwave radiation
35) Added bank shading coefficient to temperature and algae simulations
36) Corrected algae/macrophyte growth rate equation
37) Added solar information output report
38) Added option for no light limitation in algae/macrophyte growth calculation
39) Added Organic Phosphorus constituent
40) Corrected KSETT for phytoplankton
41) Fixed problem with english/metric conversion of settling rate
42) Added hydrolysis from BOD2 to BOD1
43) Changed how denitrification is handled
44) Added algae death term
45) Changed how periphyton are modeled
46) Simplified plot card input
47) Added ability to alter phytoplankton self-shading coefficients/exponents
48) Corrected how nitrogen preference is selected when phytoplankton is not being simulated
49) Changed river kilometers to double precision so model could handle large river kilometers and small element lengths
50) Added sensistivity exclusion capability for reach hydraulics (depth, width, velocity)
51) Added width parameter to sensitivity
52) Increased number of stations that the model could handle in the overlay

Modifications that were made during the conversion of QUAL-II to QUAL-TX:

1) Removal of the dynamic capability because of the steady-state hydraulic assumptions and numerical dispersion inherent with the solution technique.
2) Addition of more diagnostics to identify errors in the input data and format.
3) Addition/modification of various output reports including the creation of line printer plots and overlays.
4) Allowing input/output of metric units.
5) Allowing nitrification, BOD decay, and benthal demand inhibition at low dissolved oxygen concentrations.
6) Addition of sensitivity analyses for modeling runs.
7) Addition of macrophytes as a water quality constituent.
8) Combining of nitrite nitrogen and nitrate nitrogen into a single nitrite-nitrate nitrogen constituent.
9) Ability to alter many of the constants utilized in the model.
10) Removal of the flag field to facilitate adding or deleting waste loads
11) Allowing computational element size to vary from reach to reach.
12) Removing the limit in the number of computational elements per reach.

13) Ability to handle highly dispersive systems as well as adective systems.
14) Changes to reaeration equations including the ability to specify the maximum allowable reaeration rates and use tidal velocities in reaeration equations and the addition of new reaeration equations.
15) Conversion of benthal rates and settling rates to more conventional units.
16) Allowing settled BOD, algae, and conservative materials to be converted to sediment oxygen demand.
17) Allowing settled organic nitrogen to be converted to ammonia benthos source rate.
18) Addition of denitrification and anaerobic BOD decay as processes.
19) Inclusion of photo-inhibitation, self-shading, a preference factor for ammonia or nitrate nitrogen, and a new convergence technique in the algae simulation.
20) Allowing multiple waste loads to be input into a single computational element including headwater and junction elements.
21) Accommodation of flow reversals due to withdrawals in tidal areas.
22) Addition of lower boundary conditions for dispersive systems and systems with flow reversals at the lower boundary.
23) Ability to link several separate models together in sequence to simulate very large, very detailed, or bifurcated systems.
24) Restructuring of the program to make it compatible with DOS-based personal computers.