

NAACCR 2024 Call for Data – Patient Deduplication Instructions

This document will explain how to use the Match*Pro record linkage software to deduplicate patients and cancer cases that may exist in your registry's database.

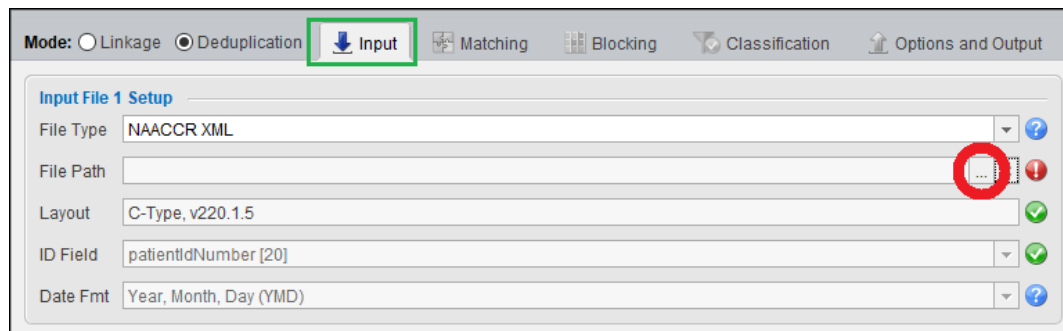
1. To get started, you will need to download and install Match*Pro version 2.5.3. The software can be downloaded from <https://seer.cancer.gov/tools/matchpro/>. **You should use this specific version of the software (or a later version if it is available). The linkage configuration will not work properly if you use an earlier version.**
2. After you have downloaded and installed the software, the next step will be to create an extract containing patient names, dates of birth, social security numbers, sex, telephone number, and addresses (both current address and address at DX) for ALL records of eligible primary tumors diagnosed from 1995-2022. If your registry's inception year is not on/before 1995 (*i.e., your registry does not have complete data until 1996 or later*) the start date for the extract should coincide with your registry's inception year. The extract should include cases obtained through data exchange agreements with other central cancer registries, federal facilities like the Veteran's Administration, and other non-hospital data sources. The extract should be created in the NAACCR-XML (version 24) format. **To minimize the linkage runtime, create an extract containing ONLY these fields:**
 - a. Patient Id Number (#20)
 - b. Name—First (#2240)
 - c. Name—Last (#2230)
 - d. Name—Middle (#2250)
 - e. Name—Birth Surname (#2232)
 - f. Date of Birth (#240)
 - g. Social Security Number (#2320)
 - h. Telephone (#2360)
 - i. Sex (#220)
 - j. Addr Current—No & Street (#2350)
 - k. Addr Current—City (#1810)
 - l. Addr Current—Postal Code (#1830)
 - m. Addr Current—State (#1820)
 - n. Addr at DX—No & Street (#2330)
 - o. Addr at DX—City (#70)
 - p. Addr at DX—Postal Code (#100)
 - q. Addr at DX—State (#80)

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3. Once you have created the extract, you are ready to begin the process of deduplicating the patients in your database. A linkage configuration file named [naacccr-patient-deduplication-linkage-cfg-20240829.mplc](#) was included with these instructions for this purpose.

Extract the configuration file from the zip folder, then double-click on it. It should open automatically with Match*Pro.

- a. If, for some reason, the file does not open automatically then you will need to manually open the file. To do this you will need to start the Match*Pro software (a shortcut for which should have been created on your desktop during the installation process). Once the software is running, click on the File menu and select “Open Linkage Configuration ...” from the list of options (this is the second option in the list). A file selection dialog will appear. Browse to the location of the linkage configuration file, select it, and press the open button. The linkage configuration will be opened.
4. Now that the linkage configuration file is open, you will need to provide Match*Pro with the location of the extract you created in step 2. There are five tabs on the linkage configuration screen. The first tab, labeled **Input**, is where you will perform this step. This tab is shown to you by default.
 - a. Press the browse button associated with the **File Path** for **File 1**, which has been circled in **RED** in the image below.



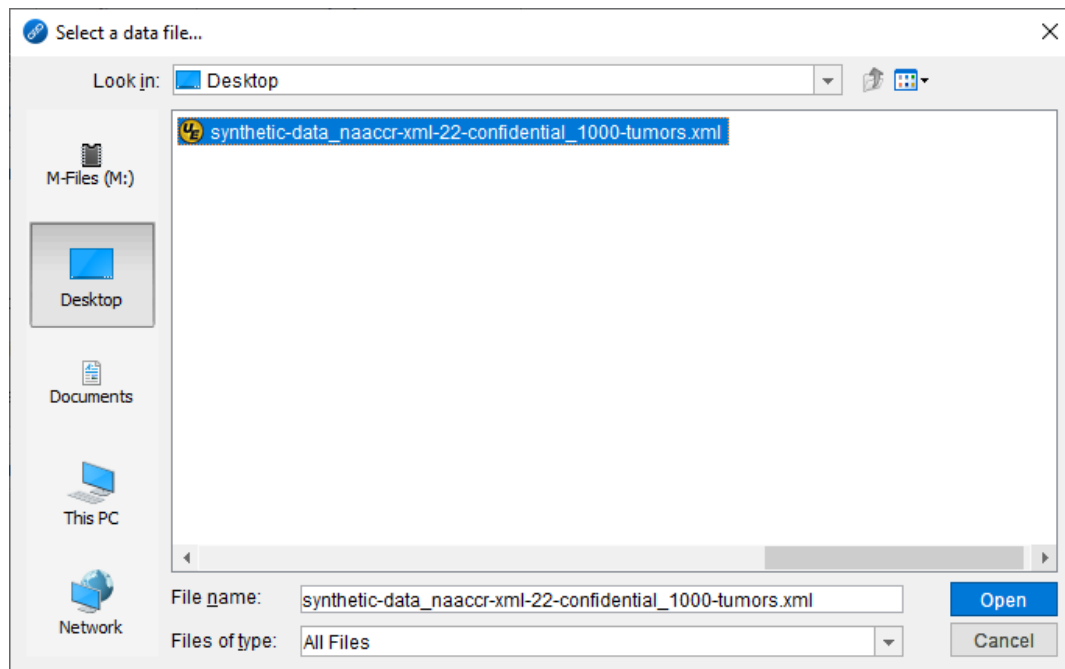
The screenshot shows the Match*Pro software interface with the 'Input' tab selected. The 'Input File 1 Setup' section contains the following fields:

- File Type: NAACCR XML
- File Path: (empty) [Browse button circled in red]
- Layout: C-Type, v220.1.5
- ID Field: patientIdNumber [20]
- Date Fmt: Year, Month, Day (YMD)

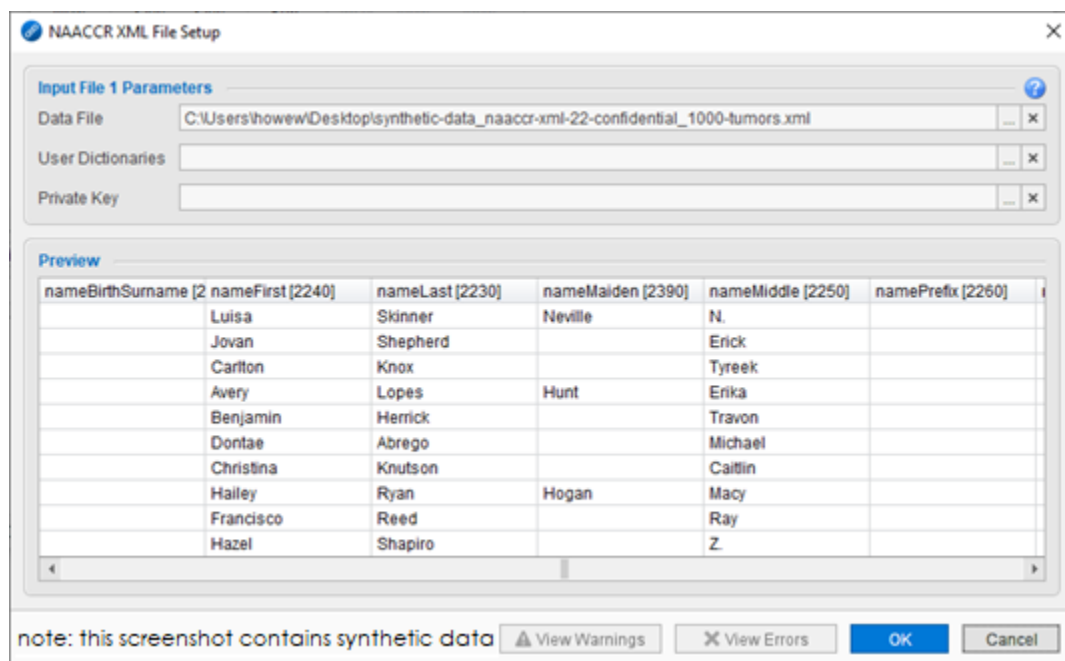
The 'File Path' field has a browse button circled in red, indicating where the user should click to select the extract file.

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- b. A file selection dialog will appear. Browse to the location of the extract you created in step 2, select the file, and then press the **OPEN** button.



- c. The NAACCR XML File Setup dialog will be displayed. You can use the preview window to verify that all of the fields have been populated. Once you are convinced that all of the fields are being read in correctly, press the **OK** button. The dialog will close, and you will be returned to the Input tab on the linkage configuration screen.



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- d. The name and location of the extract will be displayed in the text box.

The screenshot shows the 'Input' tab of a software interface. At the top, there are tabs for 'Mode' (Linkage, Deduplication), 'Input', 'Matching', 'Blocking', 'Classification', and 'Options and Output'. The 'Input' tab is selected and highlighted with a green box. Below the tabs, the 'Input File 1 Setup' section contains several fields: 'File Type' is set to 'NAACCR XML'; 'File Path' is set to 'C:\Users\howew\Desktop\synthetic-data_naaccr-xml-22-confidential_1000-tumors.xml' and is highlighted with a green box; 'Layout' is set to 'C-Type, v220.1.6'; 'ID Field' is set to 'patientIdNumber [20]'; and 'Date Fmt' is set to 'Year, Month, Day (YMD)'. Each field has a green checkmark or a help icon to its right.

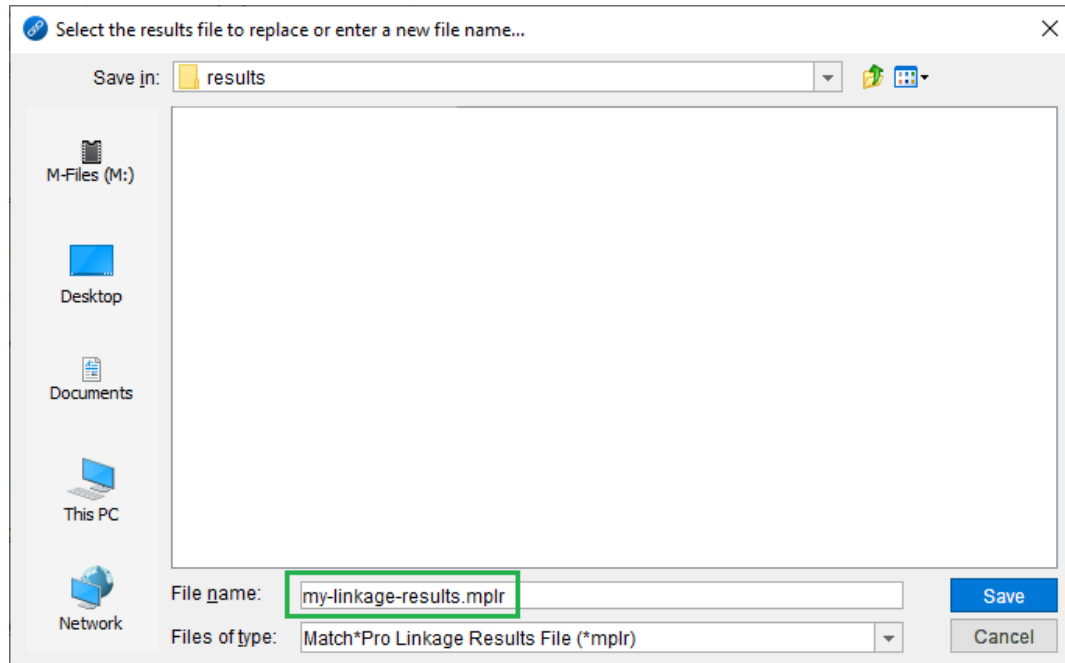
5. You are now finished with the input tab. Switch to the **Options and Output** tab. This is the fifth and final tab that is displayed on the linkage configuration screen. Here you will need to provide Match*Pro with the location of where you would like the linkage results file to be created.

- a. Press the browse button associated with the **Linkage Results File Destination**, which has been circled in **RED** in the image below.

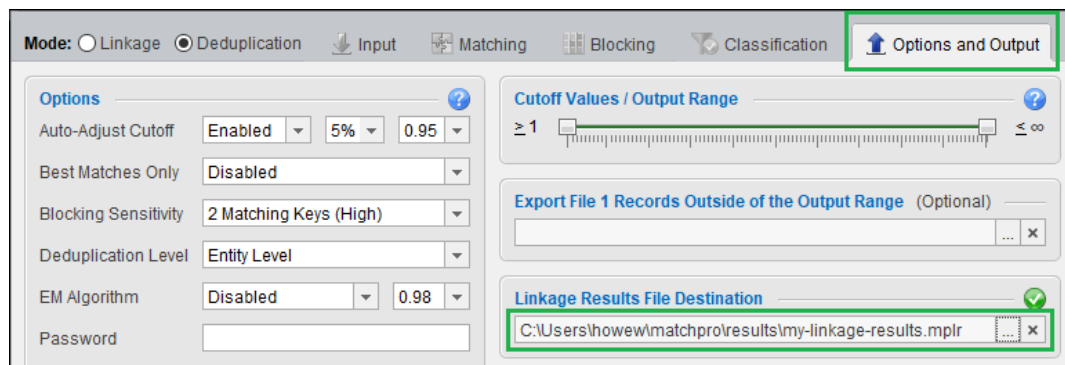
The screenshot shows the 'Options and Output' tab of the software interface. At the top, the 'Options and Output' tab is selected and highlighted with a green box. The 'Options' section on the left includes: 'Auto-Adjust Cutoff' (Enabled, 5%, 0.95), 'Best Matches Only' (Disabled), 'Blocking Sensitivity' (2 Matching Keys (High)), 'Deduplication Level' (Entity Level), 'EM Algorithm' (Disabled, 0.98), and 'Password'. The 'Cutoff Values / Output Range' section on the right shows a slider from 1 to infinity. Below this is the 'Export File 1 Records Outside of the Output Range (Optional)' section with a text box. At the bottom, the 'Linkage Results File Destination' section has a text box and a browse button (three dots icon) circled in red.

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- b. A save dialog will appear. Browse to the location of where you would like the results file to reside, then enter a filename and press the **SAVE** button. **PLEASE BE ADVISED THAT THE LINKAGE RESULTS FILE SHOULD BE CREATED IN A FOLDER ON YOUR C:/ DRIVE, AS OPPOSED TO A NETWORK DRIVE, AS SLOW AND/OR DROPPED NETWORK CONNECTIONS CAN CORRUPT THE FILE (PARTICULARLY IF IT IS LARGE). THE RESULTS FILE SHOULD REMAIN IN THE FOLDER ON YOUR C:/ DRIVE UNTIL ALL OF THE WORK OUTLINED IN THIS DOCUMENT HAS BEEN COMPLETED. DO NOT SAVE DIRECTLY TO C:/ - YOU WILL LIKELY GET A PERMISSIONS ERROR IF YOU DO. YOU MUST SPECIFY A FOLDER.**

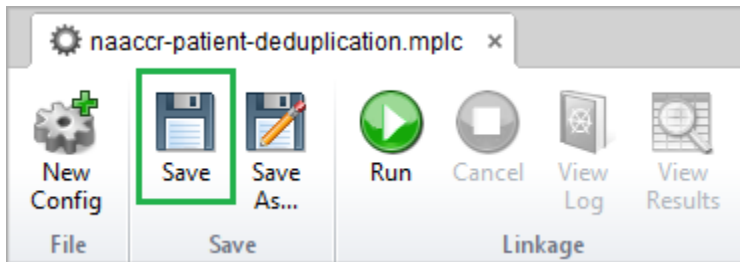


- c. The name and future location of the results file will be displayed in the text box.

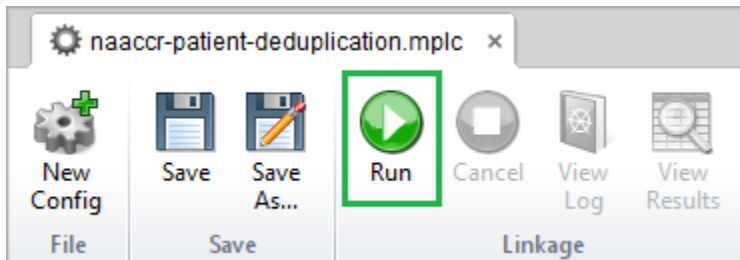


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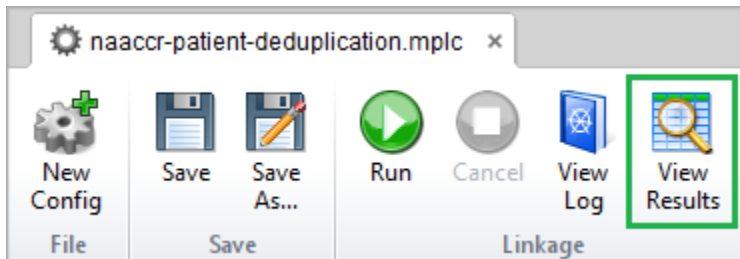
6. Press the **SAVE** button, which is located at the top of the linkage configuration screen, to save all of the changes that you have made to the configuration file.



7. Press the **RUN** button. The linkage process will begin. The run time will vary depending on the number of records that are in the extract.

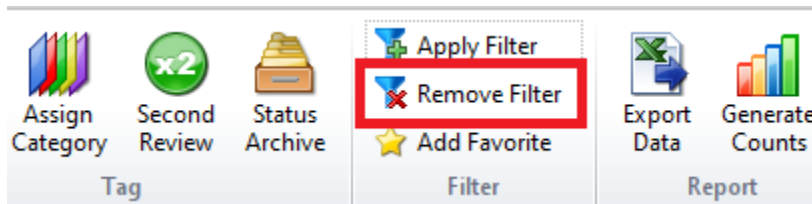


8. Once the linkage has finished running, press the **VIEW RESULTS** button to open the linkage results file. The linkage results screen will be displayed.

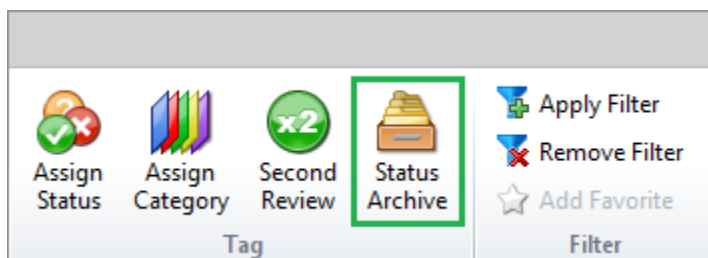


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9. If you did not use Match*Pro to deduplicate your patients last year or you did not create a status archive last year, skip this step and proceed to step 10. **You should only perform this step if you have a status archive for patient deduplication on hand.**
- Depending on the data, Match*Pro may have already classified some of these potential duplicates as non-matches. **Non-Matches** will have a **red “X”** next to them. Take a few moments to review these pairs to see if any of them might be **false negatives** (pairs that were declared a non-match that you believe could possibly be a match). If you see any, change the match status of those pairs to uncertain by clicking on the yellow question mark in column one of the rows in question. Refrain from searching for these patients in LexisNexis, Accurant, or anything similar to confirm whether or not they are matches at this point. Base the decision purely on your gut instincts for now. We will circle back to these later. We are just trying to work through the non-matches as quickly as possible. Do not be surprised if the status archive (which we are about to load) changes some of them back to non-match (which would indicate that someone already looked at them more closely last year and they truly are not a match).
 - Locate your status archive file from last year. When you have found it, **MAKE A COPY** of the file for safe keeping just in case something goes wrong during this process or you need to refer back to it later. Make sure to mark the copy as “old”. We will be updating the archive (the original, not this backup copy) later on in this process.
 - Press the **REMOVE FILTER** button to make absolutely sure there are no filters on the data at this point. **This step is very important for what we are about to do, so make sure you press it at least once to be sure.**

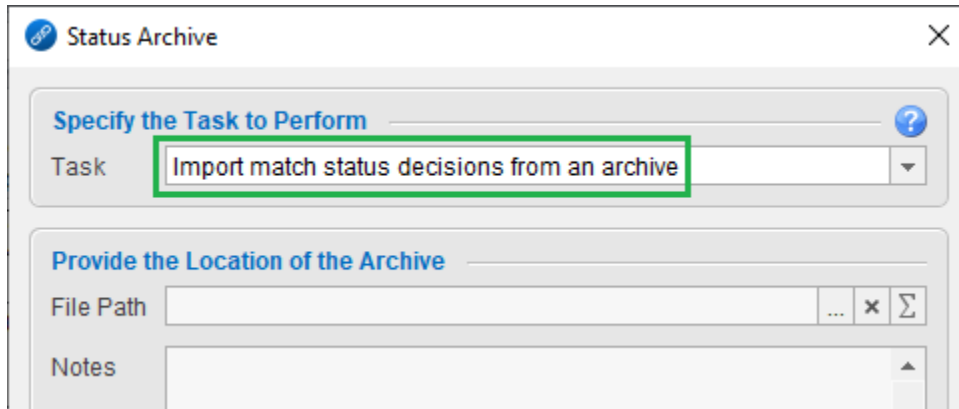


- Press the **STATUS ARCHIVE** button, which is located at the top of the linkage results screen. The Status Archive dialog will appear.



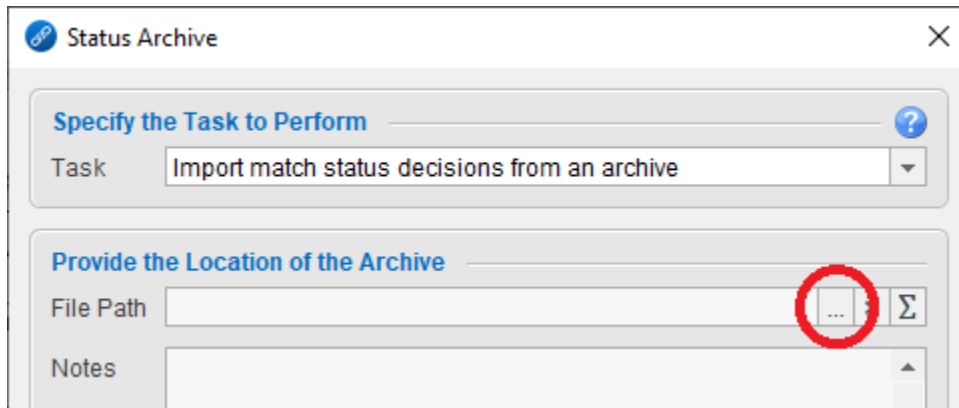
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- e. Select “**Import match status decisions from an archive**” from the drop down.



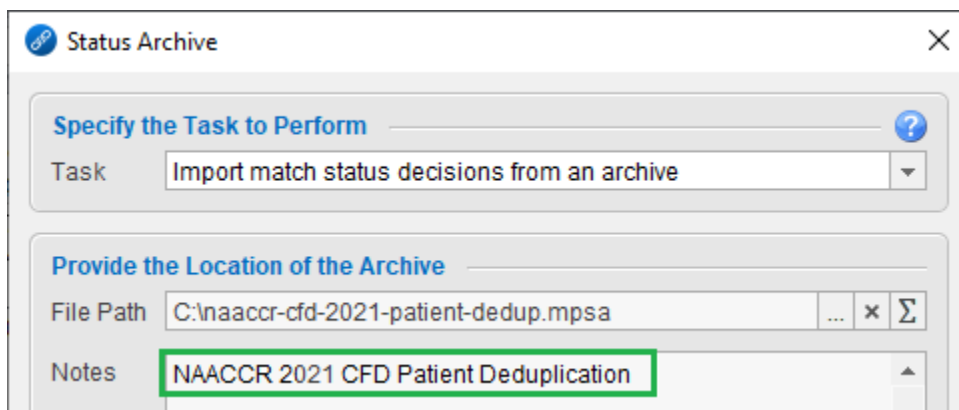
The screenshot shows the 'Status Archive' dialog box. The 'Specify the Task to Perform' section has a dropdown menu with the option 'Import match status decisions from an archive' selected and highlighted by a green rectangle. The 'Provide the Location of the Archive' section has empty fields for 'File Path' and 'Notes'.

- f. Provide the location of the status archive you created following last year’s patient deduplication linkage (*i.e.*, the file you made a copy of in step 9B). The button you need to press to do this is circled in **RED** in the image below.



The screenshot shows the 'Status Archive' dialog box. The 'Specify the Task to Perform' section has the dropdown menu set to 'Import match status decisions from an archive'. In the 'Provide the Location of the Archive' section, the 'File Path' field is empty, and the button with three dots (used to browse for a file) is circled in red. The 'Notes' field is also empty.

- g. After the file is selected the notes will be displayed. **Check the notes to confirm you selected the correct file before proceeding.**



The screenshot shows the 'Status Archive' dialog box. The 'Specify the Task to Perform' section has the dropdown menu set to 'Import match status decisions from an archive'. In the 'Provide the Location of the Archive' section, the 'File Path' field is filled with 'C:\naaccr-cfd-2021-patient-dedup.mpsa'. The 'Notes' field is filled with 'NAACCR 2021 CFD Patient Deduplication' and is highlighted by a green rectangle.

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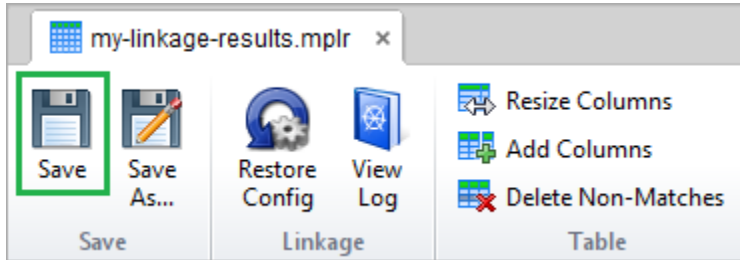
- h. Press the **OK** button. The dialog will close and the match statuses on the linkage results screen will update. Any pairs that change to non-match/red were reviewed by staff from your registry at some point in the past. They are not matches and they do not need to be reviewed a second time. By the end of this step, **you should not need to look at non-matches at all from this point forward.**
10. Depending on the data, Match*Pro may have already classified some of these potential duplicates as matches or non-matches. **Matches** will have a **green check mark** next to them. **Non-matches** will have a **red “X”** next to them. The remaining potential duplicates will have a **yellow question mark** next to them. These are the **uncertain** pairs.



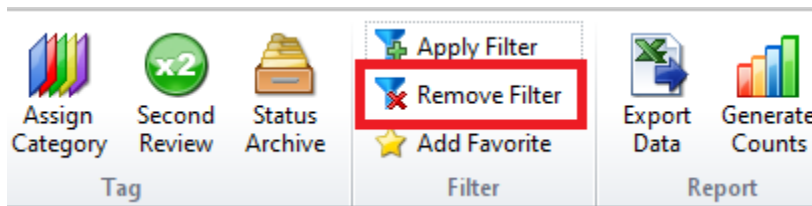
11. Take a moment to review all of the pairs with a **green check mark** next to them to see if any of them are **false positives** (pairs that were declared a match that you do not believe are actually matches). If you see them, and you are fairly certain they are not matches, change the match status of those pairs to 'non-match' by clicking on the red "X." If you are not sure, change the match status to 'uncertain' by clicking on the yellow question mark. You will come back to them later. Do not worry about looking up any of the potential false positives in LexisNexis or Accurint yet. The goal is to work through the matches as quickly as possible for now and to set aside any that are you uncertain about by changing their status to uncertain. By the end of this step, **you should not need to look at the matches at all from this point forward.**
12. Next, if you skipped step 9A because you do not have a status archive, take a moment to review all of the pairs with a **red “X”** next to them to see if any of them are **false negatives** (pairs that were declared a non-match that you believe could possibly be a match). If you see any, change the match status of those pairs to uncertain for now by clicking on the yellow question mark in column one of the rows in question. Refrain from searching for these patients in LexisNexis, Accurint, or anything to confirm whether or not any of these patients are matches at this point. Base the decision purely on your gut instincts for now. We will circle back to these in the next step. We are just trying to work through the non-matches as quickly as possible. By the end of this step, **you should not need to look at non-matches at all from this point forward.**

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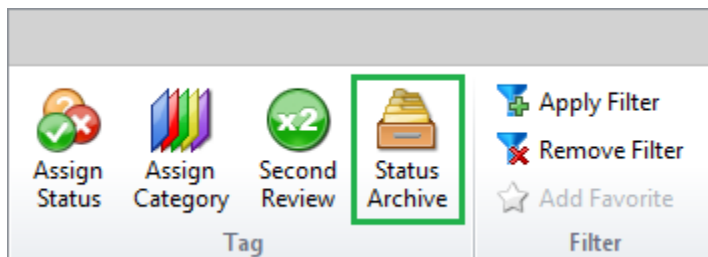
13. Review all of the yellow/uncertain pairs and assign them either a 'match' or 'non-match' status. This is where the bulk of your time performing the manual review will be spent and where LexisNexis, Accurant, or other data sources will come into play. By the end of the review process, every pair should be categorized as either a match (green) or a non-match (red). **Green pairs will need to be consolidated in your database. Red pairs should be archived** (instructions below).
14. When you have finished reviewing all of the pairs **PRESS THE SAVE BUTTON** at the top of the screen to lock in all of the decisions you made during the manual review.



15. If you did not use Match*Pro to deduplicate your patients last year or you did not create a status archive last year, skip this step and proceed to step 16. **You should only perform this step if you are already in possession of a status archive.** We are about to update the archive from last year.
 - a. Press the **REMOVE FILTER** button. **This step is very important for what we are about to do, so make sure you press it at least once to be sure.**

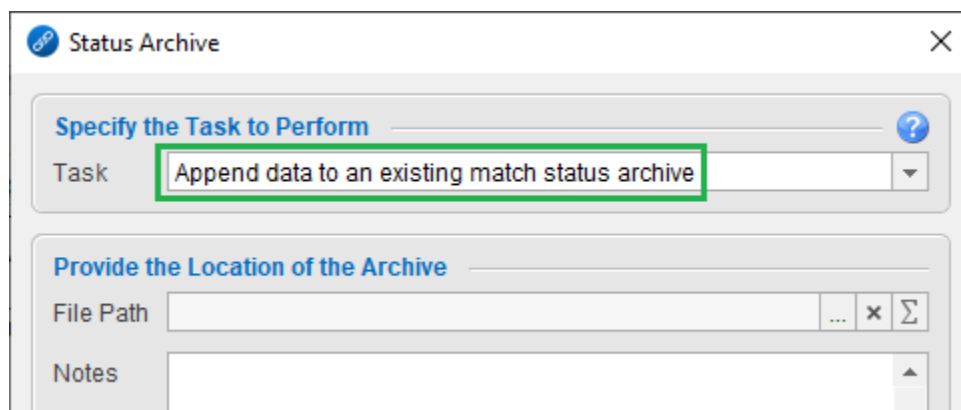


- b. Press the **STATUS ARCHIVE** button, which is located at the top of the linkage results screen. The Status Archive dialog will appear.



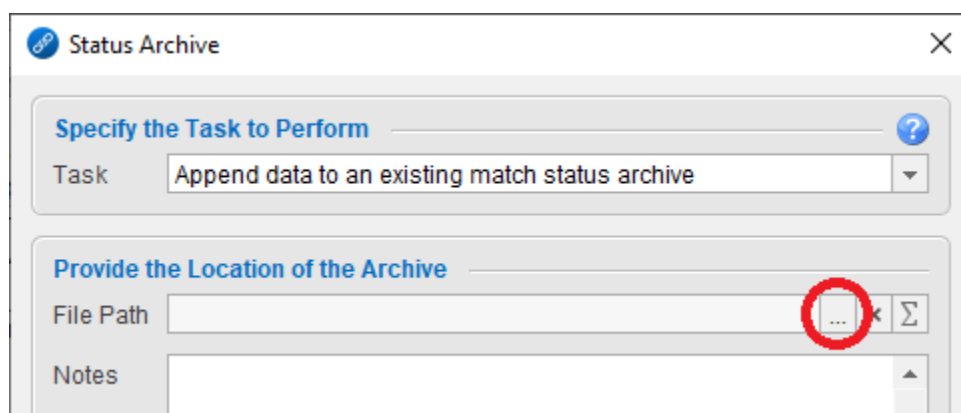
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- c. Select “Append data to an existing match status archive” from the drop down.



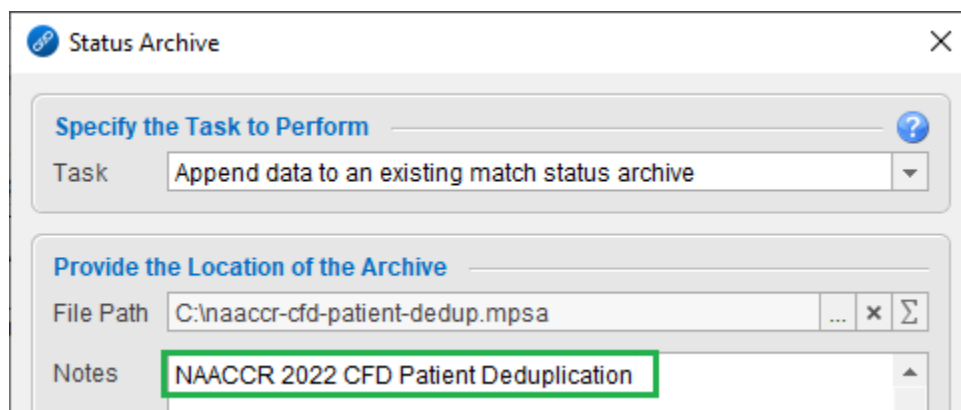
The screenshot shows the 'Status Archive' dialog box. The 'Specify the Task to Perform' section has a dropdown menu with the option 'Append data to an existing match status archive' selected and highlighted with a green rectangle. The 'Provide the Location of the Archive' section has empty fields for 'File Path' and 'Notes'.

- d. Provide the location of the existing match status archive. This would be the one you selected in step 9F. The button you need to press in order to do this is circled in RED in the image below.



The screenshot shows the 'Status Archive' dialog box. The 'Specify the Task to Perform' section has the same dropdown menu. In the 'Provide the Location of the Archive' section, the 'File Path' field is empty, and the browse button (three dots) is circled in red. The 'Notes' field is also empty.

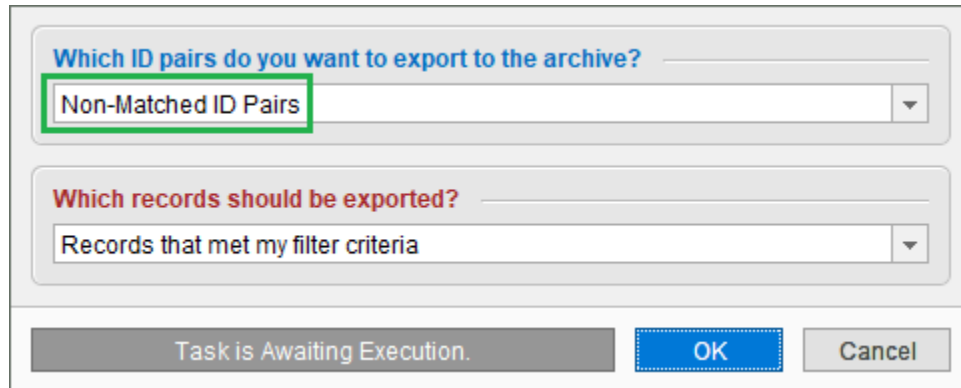
- e. Update the description in the notes field, if needed.



The screenshot shows the 'Status Archive' dialog box. The 'Specify the Task to Perform' section has the same dropdown menu. In the 'Provide the Location of the Archive' section, the 'File Path' field now contains the text 'C:\naaccr-cfd-patient-dedup.mpsa'. The 'Notes' field is highlighted with a green rectangle and contains the text 'NAACCR 2022 CFD Patient Deduplication'.

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- f. Select “**Non-Matched Pairs**” from the drop down towards the lower half of the dialog.



Which ID pairs do you want to export to the archive? **Non-Matched ID Pairs**

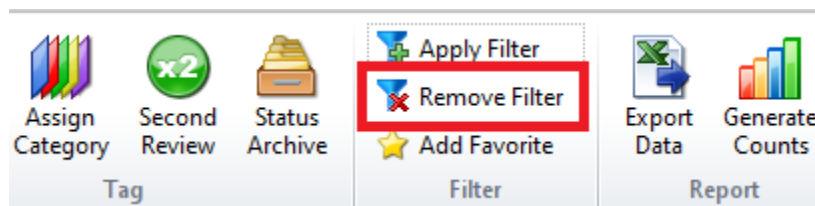
Which records should be exported? **Records that met my filter criteria**

Task is Awaiting Execution. **OK** Cancel

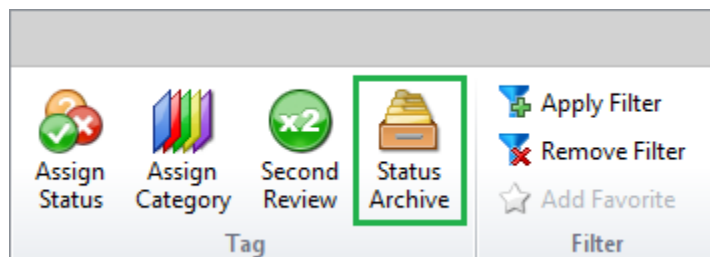
- g. Press the **OK** button. The status archive will be updated with the latest information from this year. **Make sure to save this file for next year.**
- h. Close the dialog and return to the manual review screen.
- i. **SKIP TO STEP 17**

16. Next, take a moment to create a **NEW** status archive for next year.

- a. Press the **REMOVE FILTER** button. **This step is very important for what we are about to do, so make sure you press it at least once to be sure.**

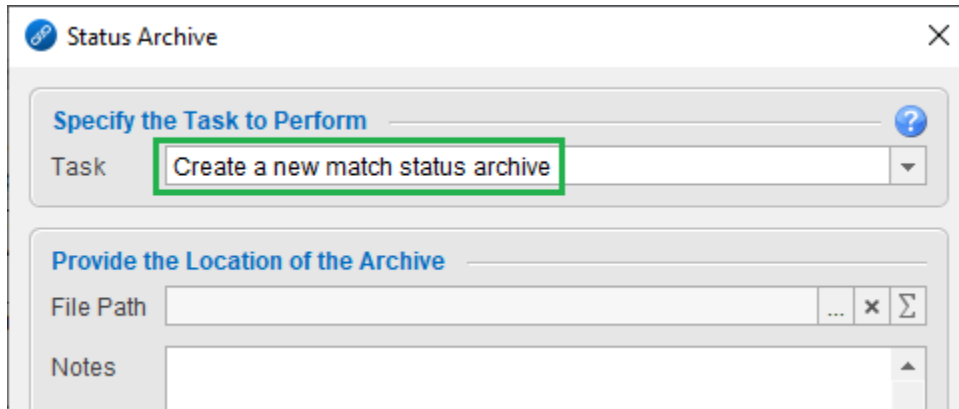


- b. Press the **STATUS ARCHIVE** button, which is located at the top of the linkage results screen. The Status Archive dialog will appear.



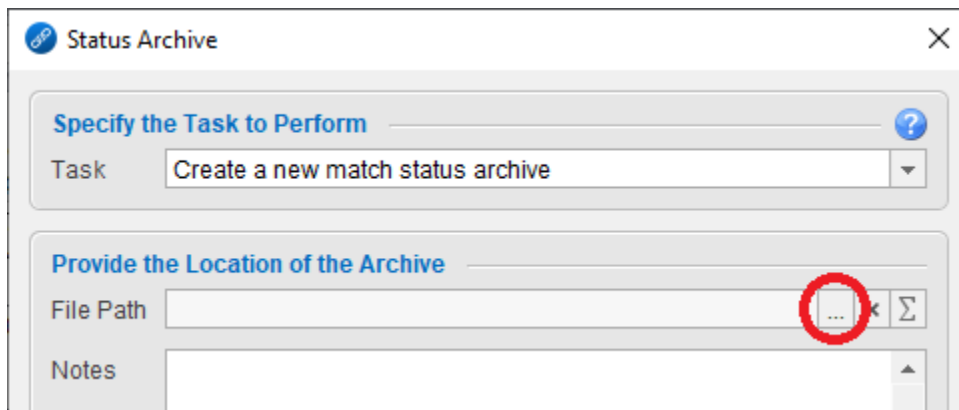
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- c. Select “Create a new match status archive” from the drop down.



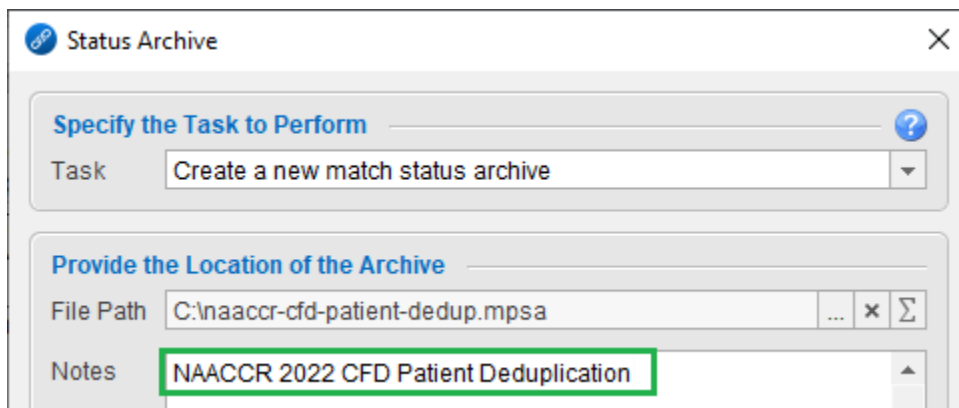
The screenshot shows the 'Status Archive' dialog box. The 'Specify the Task to Perform' section has a dropdown menu with 'Create a new match status archive' selected. This dropdown is highlighted with a green rectangular box. The 'Provide the Location of the Archive' section has a 'File Path' field and a 'Notes' field, both currently empty.

- d. Provide the location of where you would like to save the archive. The button you need to press in order to do this is circled in RED in the image below.



The screenshot shows the 'Status Archive' dialog box. The 'Task' dropdown is still set to 'Create a new match status archive'. In the 'Provide the Location of the Archive' section, the 'File Path' field is empty, and the browse button (represented by three dots) is circled in red. The 'Notes' field is also empty.

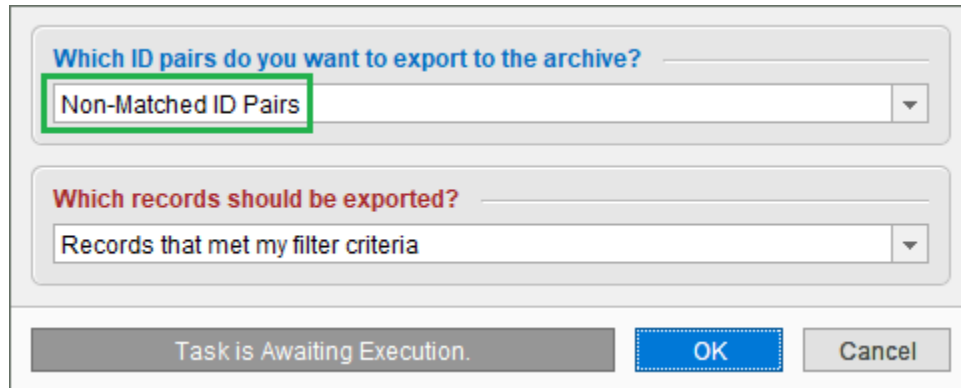
- e. Enter a description of the archive in the notes section (e.g., “NAACCR 2022 CFD patient deduplication”).



The screenshot shows the 'Status Archive' dialog box. The 'Task' dropdown is still set to 'Create a new match status archive'. In the 'Provide the Location of the Archive' section, the 'File Path' field is filled with 'C:\naaccr-cfd-patient-dedup.mpsa'. The 'Notes' field is filled with 'NAACCR 2022 CFD Patient Deduplication', which is highlighted with a green rectangular box.

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- f. Select “**Non-Matched Pairs**” from the drop down towards the lower half of the dialog.

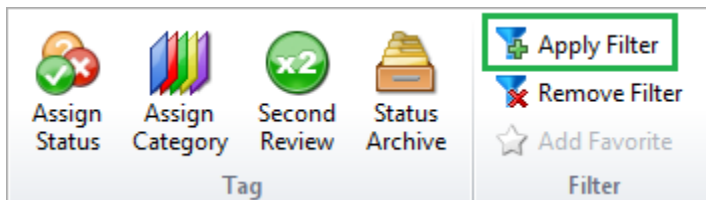


The dialog box titled "Which ID pairs do you want to export to the archive?" has a dropdown menu with "Non-Matched ID Pairs" selected. Below it, another dropdown menu titled "Which records should be exported?" has "Records that met my filter criteria" selected. At the bottom, there is a status bar that says "Task is Awaiting Execution." and two buttons: "OK" and "Cancel".

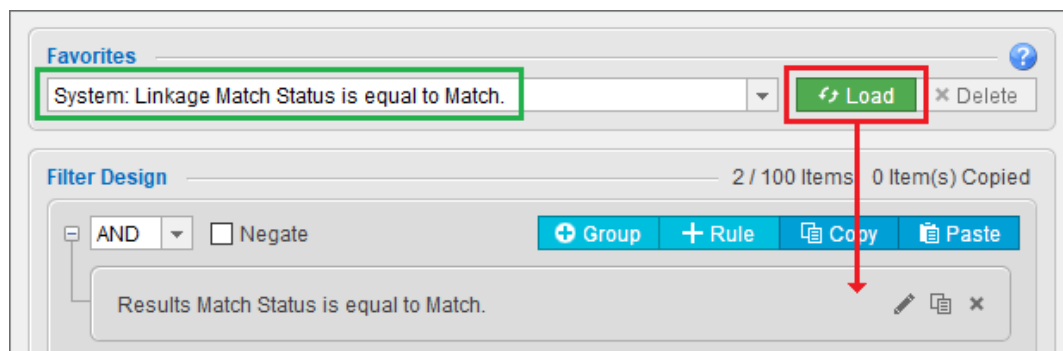
- g. Press the **OK** button. The status archive will be created in the location you specified in step 15c, above. **Make sure to save this file for next year.**

- h. Close the dialog to return to the manual review screen.

17. Press the **APPLY FILTER** button, which is located at the top of the linkage results screen. The Apply Filter dialog will appear.



- a. From the drop-down containing the list of **Favorites**, select the filter labeled **System: Linkage Match Status is equal to Match**, then press the **LOAD** button. The filter criteria will be displayed.



The "Favorites" dropdown menu is open, showing a list of filters. The filter "System: Linkage Match Status is equal to Match." is selected and highlighted with a green box. To the right of the dropdown is a "Load" button, also highlighted with a red box. Below the dropdown, the "Filter Design" section shows the selected filter criteria: "Results Match Status is equal to Match." The "Load" button is connected to the "Filter Design" section by a red arrow.

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- b. Press the **OK** button, which is located in the bottom-right corner of the dialog. The Apply Filter dialog will close. At this point you will only be looking at the confirmed duplicate patients.
18. Return to your database and consolidate all of the duplicate patients that were identified during the linkage process (the matches).
19. **CONGRATULATIONS!!!** You have finished deduplicating your patients for the NAACCR submission.