

Quick Guide to the ESPA Modeling Tools

This quick guide to the ESPA Modeling Tools can help the applicant answer the following FAQs regarding modeling **transfer** applications in the ESPA.

What is the purpose of the ESPA modeling analysis? Idaho Code 42-222 states that water right transfers must not cause injury to other water users. Surface water in the Snake River and many tributary springs are considered fully appropriated. Changes to groundwater use can deplete the river and spring flows. This analysis is necessary to quantify those depletions, so injury can be identified and avoided or, if possible, mitigated.

Does my proposal lie inside the boundaries of the ESPA, and do I need to complete modeling? The ESPA covers a great portion of southeast Idaho. We recommend using the online Water Right Locator Application to view a map of the ESPA. Simply follow the link to view a map of the state of Idaho:

<https://idwr.maps.arcgis.com/apps/webappviewer/index.html?id=bdaa8ddbf5a84d63b722a16e26695ff5>

Click the layers button. Turn on the “ESPA Model Outline” layer. Zoom in for a more detailed view. If the transfer proposal location lies within the outlined area, it falls within the ESPA. Modeling is required. To begin this process, identify which grid cells contain the “to” and “from” locations of the water right(s) being considered in the transfer proposal.

What are the grid cells? The grid cells are numbered sections of the ESPA. We recommend using the online Water Right Locator Application to view the grid cells themselves. Simply follow the link to view a map the grid cells within the ESPA:

<https://idwr.maps.arcgis.com/apps/webappviewer/index.html?id=bdaa8ddbf5a84d63b722a16e26695ff5>

Be sure to turn on the “ESPA Model Grid,” and then zoom in to the “to” and “from” locations of the water right(s) being considered in the transfer proposal. Zoom in until the model grid cells are added to the viewing area.

Zoom in to the “to” and/or “from” locations until the row and column values are identifiable for each location. Take note of these numbers; they are inputs into the ESPA Model Transfer Spreadsheet.

What does the ESPA Model Transfer Spreadsheet analyze? The ESPA Model Transfer Spreadsheet was designed for individuals with little experience using ground water modeling software. This spreadsheet acts as a user interface for the actual ESPA model in groundwater modeling software. ESPA Model Transfer Spreadsheet allows the user to view data and graphical outputs in Excel. Essentially, this Excel workbook allows the user to review the calculated effects of the transfer proposal on the ESPA.

How do I run the ESPA Model Transfer Spreadsheet? The ESPA Model Transfer Spreadsheet contains instructions on how to fill the input values, run the model, and calculate effects. Open the Excel workbook to review the instructions before running the model. Once you have run the model and examined the results, copy the data at the bottom of the Calculated Effects tab into the Mitigation Analysis Spreadsheet.

What does the ESPA Mitigation Analysis Spreadsheet analyze? The ESPA Mitigation Analysis Spreadsheet (informally called Mitigation Analysis Tool, or MAT) will assist the user in determining the extent of the transfer proposal's impact on flows in the Snake River and whether the depletions to each reach will require mitigation. This spreadsheet allows for the net evaluation of up to 19 individual one-way transfers.

How do I run the ESPA Mitigation Analysis Spreadsheet? Begin the mitigation analysis by setting the “Mitigation Analysis Period” to “trimester” (upper left corner), to match the ESPA Model Transfer Spreadsheet timeline. Copy and paste the data from the bottom of the Calculated Effects tab (ESPA Model Transfer Spreadsheet) into the Mitigation Analysis Spreadsheet under the box entitled “Impact by Reach (AF/Trimester).” The boxes entitled “Steady State Analysis” and “Transient State Analysis” will instantaneously fill with values to determine the extent of mitigation required.

How do I interpret what I see in the ESPA Mitigation Analysis Spreadsheet?

1. *New Water Right box:* The highlighted box at left (orange, blue, violet, green) is designated for the user’s reference. For the purposes of this review, the data input here (water right number, diversion rate, volume, irrigated acres, priority date, diversion location, transferred volume, node) does not affect the modeling analysis.
2. *Impact by Reach box:* The plain box at right (pasted into the sheet) entitled “Impact by Reach (AF/Trimester)” displays the pre- and post- steady state and transient state depletion values for each of 11 reaches of the Snake River: Ashton to Rexburg, Heise to Shelley, Shelley to near Blackfoot, near Blackfoot to Neeley, Neeley to Minidoka, Devil’s Washbowl to Buhl, Buhl to Thousand Springs, Thousand Springs, Thousand Springs to Malad, Malad, and Malad to Bancroft.
3. *Steady State/Transient State Analysis boxes:* Beneath the “Impact by Reach” box, the depletion values are broken out by Steady State Analysis and Transient State Analysis. Each state has a multiple “Mitigation Checks,” or tests to determine whether mitigation is necessary.

Steady State Analysis	Transient State Analysis
<ol style="list-style-type: none">1. Is the total increase in volume greater than 10% of the historical depletion volume?2. Is the total increase in volume greater than 2 acre-feet/trimester?3. Does the depletion in this reach make up more than 10% of the total depletion to the river? <p>If the answer to all three questions is YES, then mitigation is required for this reach.</p>	<ol style="list-style-type: none">1. Is the total increase in volume greater than 10% of the historical depletion volume?2. Is the total increase in volume greater than 2 acre-feet/trimester? <p>If the answer to both questions is YES, then mitigation is required for this reach.</p>

What proportion of the depletions do I need to mitigate?

For those reaches where the sum of all changes in depletion is positive, including depletions during the transient state, the combined depletion volume must be *fully* mitigated. (The applicant is not eligible to only mitigate enough to fall below the SS and TS thresholds.)