**Setting QC / Alarm /Alert Limits in HydroBase Job Sheet**

The **HydroBase** (i.e., **Hydro Database Manager**) application allows you to adjust data quality control limits to flag data as **Good**, **Bad**, or **Questionable**. It also allows you to set limits to trigger an **Alert** or **Alarm** if data is above or below certain values, or if consecutive reports exceed a **Rate-Of-Change** (ROC) or **Difference** (Diff) limit.

There are settings that apply to **all data** for one **Physical Element** (PE) type, such as **HG** for river stage, **PP** for precipitation accumulation or **PC** for incremental precipitation, or for any other **PE** that you assign limits.

- Limits that **affect all sites** are stored in the **datalimits** table of the Hydro DB
- In addition, those limits can be customized **for each station**.

- **Single-site limits** (station-specific) are stored in the **locdatalimits** table

1. **Default – datalimits table**

- In **HydroBase**, select **DataIngest** > **QC/Alert/Alarm Limits**
- The **Limits GUI** opens ... showing Default limits
  - See **Image 1** on the next page
- In the upper left corner, there is a pulldown labelled **Default**
  - Everything on this screen applies to **ALL STATIONS** in your Hydro DB
  - If you change a **Quality Control Limit** or **Alert/Alarm Limit** (in box #5) or **date range** (in box #4) on this page, it applies to **every station** for the **selected PE**

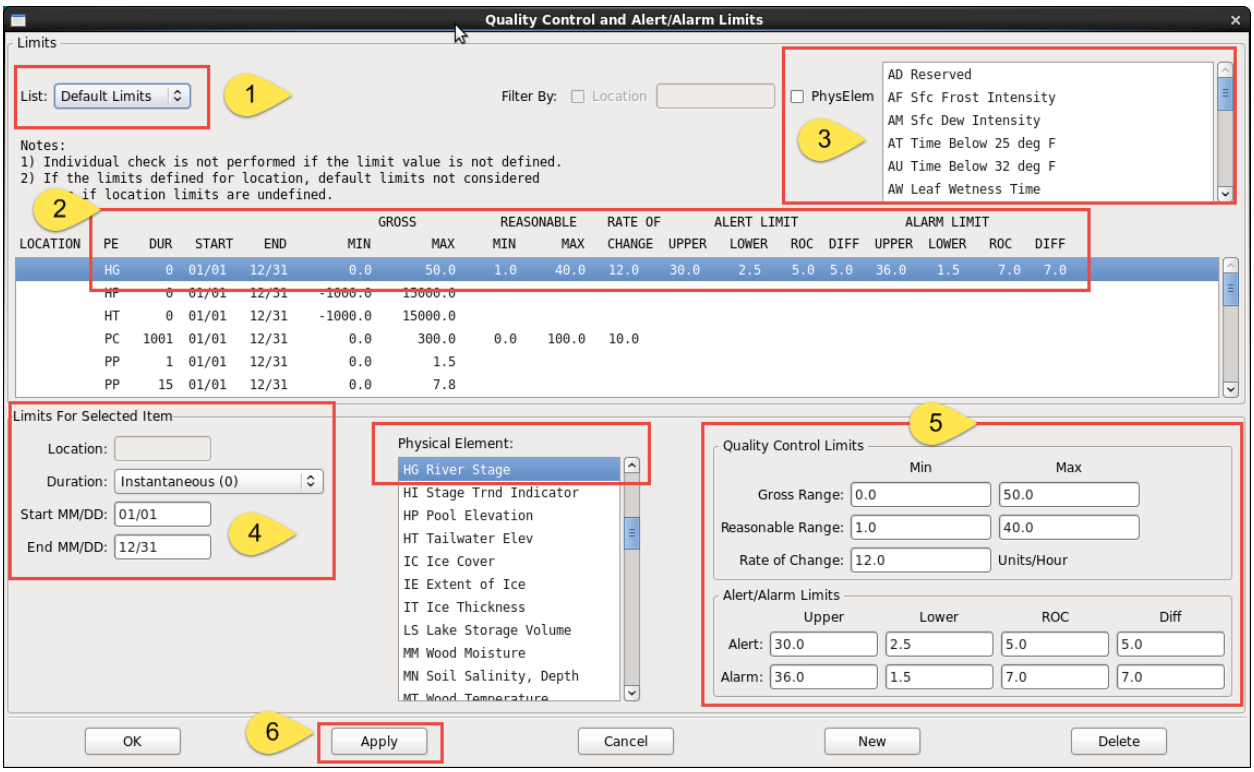
The numbered red boxes on the graphic point out the following:

1. The GUI opens up on the **Default Limits** page, affecting **ALL** stations

2. **Default** limits may be set for each **PE** (Physical Element)

**HG** = height (limits set below affect only this PE for the highlighted line)
**DUR** 0 = instantaneous report
**START** and **END** = dates the limits apply
**GROSS MAX** and **MIN** = absolute limits for **GOOD** data
**REASONABLE MAX** and **MIN** = limits to signify **QUESTIONABLE** reports
**RATE OF CHANGE** (units per hour) maximum allowed for **GOOD** data
**ALERT LIMITS** – reports that trigger ALERTS
**UPPER** = reports at or above this level
**LOWER** = reports at or below this level
**ROC** = ROC at or above this value (units per hour)
**DIFF** = subsequent report differences at or above this amount
**ALARM LIMITS** = similar to **ALERTS**, but trigger **ALARMS** (flashing icon & audible sound) at higher/lower values

**Image 1** - **Default Limits** – Affecting ALL stations in your database




3. Check the **PhysElem** box to select only one **PE** to display in the table

4. This box is where you set dates to apply the **Default Limits**

5. This box is where you set the actual limits

- Make sure you look in the **Physical Element** box just to the left and see the correct **PE** highlighted for which you intend to set/change limits
- You do not have to fill all the boxes, but for **HG** you should have the **Quality Control Limits** set and probably **Upper Alert** and **Alarm** values
- Set a **Lower Alert/Alarm** limit for **critical values** at a water intake level for a water plant or nuclear power facility, etc.

6. Hit the **Apply** button to save changes, then **OK** to close the GUI

**REMEMBER**: These changes affect **ALL** stations with data for that **PE** !!

**Gross Range Max and Min**:

For sites reporting heights (**PE**=**HG**) as height **above Mean Sea Level** (**MSL**):

- If you have no sites **above 4000** feet MSL, set a **Gross Max** of 4000.0 to reject any river stage (**HG**) report above 4000 feet MSL
- If you have no station **below 500** feet MSL, set a **Gross Min** of 500.0 to reject any report below 500 feet MSL
- This would narrow the **default** settings of 15,000 (MSL) and -1000 (MSL)

For sites reporting heights (**PE** = **HG**) as height **above a local datum**:

- If all sites have a maximum reported stage or Flood of Record that is well **below 100 feet**, set a **Gross Max** of 100.0 to reject any report above 100 feet and a **Gross Min** of 0.0 to reject reports below 0 feet (or perhaps -5.0 feet for stations reporting values below 0.0 due to scour, low datum, etc.)
- Allow room to reach a new record stage for the highest possible report from ANY of your stations

**BAD Data**

All reports that come in above the **Gross Range Max** or below the **Gross Range Min** are flagged as **bad data**.

- If the **shef_post_baddata** token is set to **REJECT**
  - **Bad data** (failed **Gross Range** check) is stored in the **RejectedData** table
  - This bad data is only visible in ...
    - Hydro perspective > LiveData > **Rejected Data Trash Can**
  - This data is **NOT** available to WHFS applications

- If the token is set to **PE**, the data is stored in that PE table
  - For example, in the height table for river stage (**HG**) data
  - This data **IS** available to the WHFS applications that **DISPLAY** data, such as the Hydro perspective and **Hydro Time Series**
  - This data **IS NOT** used by applications such as **RiverPro** or **Precip Accumulation** function, etc., since it is flagged as **BAD**

- Make sure to note the token setting and explain to the staff the implications of bad data being visible (or not) so nobody is caught off guard.

**Setting Date Ranges**

Note that in the middle section of the **Default** page you can specify date ranges. Usually you would choose to do this on a site-by-site basis (see next section),

but you can do it for all sites also on the **Default** screen. You may choose to have a lower **Gross Range Max** in the winter for example.

There is one trick involved here. The software cannot set dates across the end of the year (December 31), so you may need to use dates that apply to three periods, such as:

- January 1 – March 1
- March 2 – October 31
- November 1 – December 31

2. **Location Limits - locdatalimits table**

- In **HydroBase**, select **DataIngest** > **QC/Alert/Alarm Limits**
- Pull down the **Default** label and select **Location Limits**

This screen will apply to only a single station at a time by putting the location ID (LID) in the **Location** box and checking the button next to it.

- The **Limits GUI** opens ... showing **Location Limits**.
- See **Image 2** on the next page

The GUI shows the current **Location Limits** set for one station, **AGYM7**...

The numbered red boxes on the graphic point out the following:

1. The limits on this page apply only to a **Single** station (location)

2. Check this box and enter a valid **Station ID**

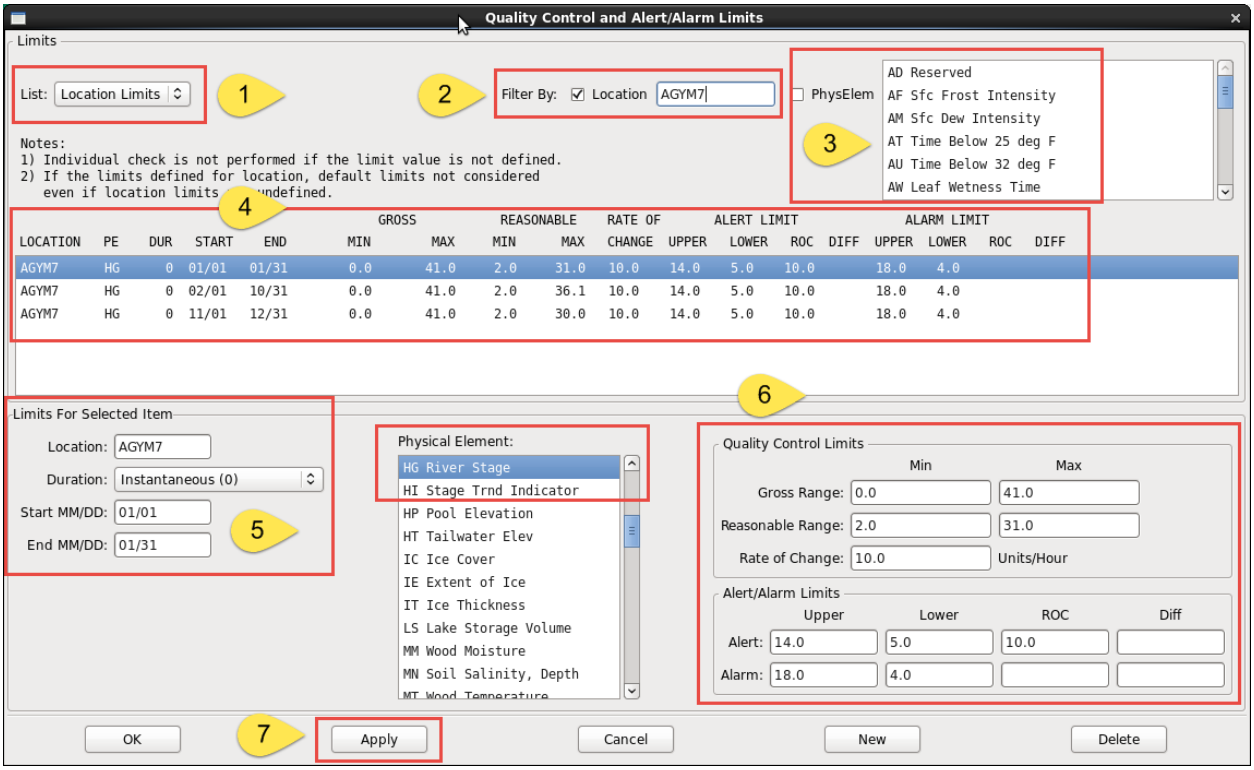
3. If you check the **PhysElem** box, the table only shows the **PE** you select

4. This station only has **HG** location limits set
   Note the **START** and **END** dates cover a whole year, chosen to apply different **REASONABLE MAX** for each period in this example

5. Change the dates for the highlighted period using this section (or you can delete this highlighted entry using the **Delete** button in the lower right corner, then set different dates to apply for one of the other limits

6. Change actual **Range Check** limits (**Quality Control Limits**) or **Alert/Alarm Limits** in this box, and verify the correct **PE** is highlighted in the area to the left

**Image 2** - **Location Limits** – Affecting only a specific station




7. When done, select **Apply**, then click on **OK** to close the GUI

THE END