**Response to IDEM Questions – Agilaire LLC – May 10, 2021**

1. As a small company, can you describe how you were able to ensure stability and consistent  
   results for your clients during periods of enhanced workload, on-site requirements (i.e., travel),  
   and during the economic strain in 2008-2010 and during the COVID pandemic in 2020?

Three elements ensured our success during these periods and are a part of our ongoing risk management strategy:

* Agilaire maintains a diverse base of customers, not just US government air quality agencies (overseas projects in the Middle East, Far East, and South America, industrial sources, air quality consulting firms, etc) to level out variations in any particular market. For example, during the 2008-2011 downturn, our give largest projects were industrial/energy companies in Australia, US, Canada, and two projects in Mexico and South America.
* For wide-ranging effects (economic, pandemic), Agilaire operates from a strong cash position with reserves to weather downturns without laying off highly trained and experienced staff that will be needed after return to normal conditions. Our people and their experience and expertise are a key asset.
* Agilaire does not suffer from the external pressures of outside ownership that may not share the long-term vision and goals of focusing on being the leader in air quality monitoring software. When economic pressures hit, larger consortiums can make decisions to eliminate important product lines if they are ‘not profitable enough’. In fact, such a decision made the Agilaire spin-off possible in 2005, allowing founding by a staff that was focused on the needs of the public air quality agencies.

With regards to on-site requirements, most of our work can be performed remotely (support, training, and project implementations due to the remote support / diagnostic capabilities built into our products). We have had only three events requiring on-site services (one training, two involving interface with hardware). In those cases, local agency COVID protocols were followed, and in the last two of those three, Agilaire and agency staff had received vaccinations, but agency mask protocols were still followed.

1. It seems the Agilaire product is mature through the years of operation; what changes or  
   adjustments did you have to make to your "product" in order to accommodate the two LEADS  
   implementations?

Customizations for the VADEQ project, other than the new web site, were very minor (enhance 8872 Trend display for faster update rate). Enhancements for the web site included:

* Change existing Forecast Widget to DEQ preferred layout (regions)
* Add Site Announcement to page an editor for announcement entry and scheduling

For the Clark County project, our product enhancements included:

* New annual AQI report (similar to LEADS report)
* Unusual Indicators report (similar to LEADS report)
* Polling Status Display
* Data QA Level Marking

1. What did you do to make the product an equal purchase or value for the customers replacing  
   LEADS vs. your regular customers?

While we don’t have detailed data for what agencies previously paid for LEADS products or support, we understand from one that Agilaire / AirVision is providing them a considerable reduction in cost. That being said, Agilaire operates from a standard product pricing list, and relatively standard costing formulas for support and hosting. Our goal is always to maintain equity among our entire customer base for pricing and service levels.

1. Are you willing to provide the criteria that would constitute a Change Order?

Initial Project - Our philosophy is to minimize change orders to the maximum extent possible, which is one reason we spend extra effort in the RFP/RFQ stage identifying unknown elements and clarifying customer expectations to the fullest extent possible. If a requirement is unclear and cannot be clarified as part of the RFP/RFQ process, we try to clearly identify it as such, and leave it as a “TBD” item or “needs more requirements definition” and a change order with known costs / hourly estimates can be implemented once detailed requirements are developed and agreed.  
  
For smaller items that might arise during project implementation, if the effort is relatively minimal, we will incorporate the difference as part of the design revision. As a general rule, changes would probably need to involve at least 8 hours (individually or, in some cases, a batch of smaller scope changes) of unanticipated effort to trigger a request for a change order.

Ongoing Product Support – see #11.

* 1. How much of the two previous LEADS implementations resulted in Change Orders? And  
     why?

No change orders were involved in the VADEQ or the Clark County project to date, nor for any projects to our recollection from initialization to acceptance. Some projects involved requests for additional enhancement long after initial system installation / acceptance (San Joaquin APCD has contracted two custom reports, but not commencing for > a year from the original installation, and for requirements not in the original project).  
  
An example related to #4, for the Clark County project, the County wanted to have a method to automatically bring in filter sample records from new MetOne E-FRM samplers. The headers did not match the File Import logic and required customization to specially strip information from the unformatted file header. Even though Clark County was the only customer using the E-FRM, we weighed the time required (well over 12 hours) against the potential of future need by other customers, and implemented the changes at no additional cost / no change order.

1. Did you utilize an independent arbitration board of one or more Director level managers drawn  
   from peer air monitoring agencies with direct experience in a similar project implementing  
   LEADS (e.g., replacement of upgrade of their air monitoring DMS with an AirVision system)?

Such language has never been utilized in our projects to date, nor any projects involved any arbitration, litigation, or serious disputes. Again, we put considerable effort in the front end of the RFP/RFQ process and in the first weeks of the project to clarify requirements to the fullest extent possible end ensure expectations are mutually agreed. Our expression of this language is such that, were arbitration ever required, it would be best handled by an individual or team with particular experience in this niche industry, terminology, etc, as they are uniquely unlike other generalized IT projects.   
  
Only one project (a tribal agency) involved any threat of legal action, an issue we responded to immediately by identifying the deficiency of analyzer equipment and issues with the experience level and cooperation of the site technician. We documented clearly all efforts we made with that individual, and recommendations we had made to help them resolve their instrumentation issues (even though resolving analyzer problems was not part of our scope of work). After providing our documentation to the supervisor, no action was taken. It had been unfortunately and unexpectedly escalated by the supervisor (who had never spoken to us about the issue before having an attorney send us a letter), when the situation could have been more easily handled with direct contact between the principals.

1. Can you confirm that zero level of effort is required for the Out-Of-The-Box hardware  
   requirements found on the hardware tab of Attachment F1 - Technical Requirements Matrix  
   1. What assumptions are you making that support this level of effort?
   2. Is this level of effort assessed somewhere else?

This is based on our expectation that, other than for instruments named below, that the interface to these instruments *are all managed by the Sutron / Xpert2 logger, and that our responsibility ends at bringing averages and calibration results from the Sutron logger per the documented CCSAIL protocol.* If we have misunderstood the intent of scope, please advise per details what other requirements would exist for the DMS. This is our understanding based on the Q&A Responses, Round 1, Question 2.  
  
Because the Xpert2 loggers remain in place, the DMS will not directly interface with any of the gas analyzers, met equipment, aethelometers, other than the following:

For instruments that would normally not be connected to the Xpert2:

* AutoGC – result files (.tx1) would be collected via File Hiker from EZChrom PC to AirVision server. Drivers already exist and are developed.
* Partisols, TISCH Hi-Vol, URG, Suma, SASS / Super SASS – downloaded files imported via File Import Tool (see proposal). File import template configuration time is accounted for as part of our estimated configuration labor.
* PM monitors that may be connected via Direct Poll, as referenced in our proposal.

Finally, if the intent is also to cover possible future upgrades of the Xpert2 to the Agilaire data loggers, we can affirm that drivers are available for the instrument list to handle such a future upgrade. We maintain regular contact with analyzer providers to try to ensure drivers are available before products reach the market commercially.

1. Can you specify the explanation of level of effort in Rows 47 and 55 of the hardware tab (i.e., the  
   requirements related to AutoGC hardware) of Attachment F1 - Technical Requirements Matrix?

For the Markes Agilent Device, data would initially come from the result (.tx1) files from the EZChrom software. These files can be imported manually via the File Import Tool, or a real-time link can be created using our File Hiker software, which loads a program on the EZChrom computer to present a web service (HTTP) interface to automatically collect and import the result, blank, and CCV files every hour. Installation and testing of the File Hiker program can be done by IDEM staff (with access to the computer, or by Agilaire if remote access is provided) and tested, generally in less than one hour.  
  
For other non-continuous GC data, IDEM would provide example file formats for review and confirmation of compatibility with the Generic File Import Tool. Per #4, if small code changes are required for any preformatting, this can generally be done without a change order.

1. Please provide more detail about how you will ensure training efficacy, including ensuring that  
   knowledge is transferred and new skills can be demonstrated.

Per our proposal, Proficiency verification tests will be developed based on three roles (site technician, QA staff, system administrator) and be completed before the first site installations. Our approach would be such tests would allow the use of resources (manuals, Agilaire online tutorial videos, etc) to fully mimic the availability of such resources in regular situations and encourage the use of these available and helpful resources. The test would be a combination of question and answer form (e.g., written test) as well as practical applications requiring the user to generate reports and data sets on test data in the software to demonstrate competency.

1. How will your team be structured in order to execute the project in accordance with the Project  
   Implementation Plan?

Allocation of personnel and tasks is listed in Attachment F starting on page 14. At a top level, the general flow of people and tasks are as follows:

Phase 0

* *Steve Drevik, Paul Yankey-* design and provide primary setup information request forms (sites, parameters, QC check levels), review and iterate with IDEM for server setup. Develop and submit EAD documents and data migration plan.
* *Steve Drevik, Paul Yankey, Debra Grey*- Work with IDEM to finalize site cutover schedule.
* *Steve Drevik, Randy Brown*- develop requirements and work with IDEM to refine requirements for enhancements. Initial telemetry testing with Xpert2.
* *Debra Grey*- Develop Proficiency Test Plan/Materials, Initial User Training + Proficiency Testing
* *Paul Yankey*- Server Provisioning

Phase 1, 2

* *Paul Yankey, Debra Grey*- Support IDEM in site conversions. Manage data migration subcontractor.
* *Paul Yankey*- Provision initial AgileWeb site, develop final site requirements with IDEM.

Phase 3

* *Paul Yankey, Randy Brown*- Oversee web site contractor for web site enhancements.
* *Steve Drevik, Paul Yankey, Debra Grey-* Support UAT, Quality Gate, Close-Out.

1. Please provide more detail about how the 80 hours allocated to building the website will be used.

Agilaire will initially bring a base AgileWeb site online after the first 2-5 sites are integrated, showing map integration, confirming representation of the AQI matches IDEM preferences, which other map layers may be desired, etc. At that point, we generally enter into a discussion with monitoring and other stakeholder groups (typically there are multiple stakeholders involved in the public web site) and identify requirements for branding, additional content for the public, desired quick report links, etc. We create a requirements document, and proceed with implementation, most likely as IDEM is managing the rollout of remaining sites (this is the norm).

* 1. explain what will happen when the 80 hours are used and additional on-going  
     support is required.

We assume ‘support’ in this case to mean additional changes to the web site (new content, and site changes), not technical support (e.g., fixes) which would be covered under the support agreement. Depending on the degree of changes, some changes can be managed by IDEM via the configuration editors (disabling sites, adding announcements). Other small changes can often be incorporated into standard support time. More extensive web site changes (>4 hours) can be given an estimated number of hours and treated as a change order.

(Note that for many of our customers where we manage the web site, their support agreement includes a “Gold Service” with a retainer number of hours for web site or other significant AirVision configuration work. However, the RFP structure did not allow for us to offer this, and our proposal stated that the Enhancements Pool could be used for additional work beyond the 80 hours.)

1. What criteria are you going to use to differentiate enhancements from included on-going support?

See proposal, Appendix A, Section 14, “Change Management Process”. Briefly reiterated here- ongoing product improvement enhancements can be driven by customer suggestions, and are generally weighed based on three factors:

* Applicability (what % of users are likely to experience the improvement?)
* Usefulness (what is the value of the improvement, e.g., time saving, etc)
* Difficulty (how much work is involved)

Suggestions that rate highly on the first two and are low difficulty will move up the list for implementation. Of course, customer suggestions are implemented after fixes, mandatory EPA requirements (e.g., 1-Point QC AQS reporting, AirNow reporting changes) and contracted customizations that are part of projects.  
  
Proposal Appendix A, Section 14 shows some example suggestions that evolved into product enhancements. More recently, our enhancements have also included the ability to map PAMS blank/CCV data into calibration database to use existing cal reports and trends

1. How many environments will be provided?

As the RFP did not dictate multiple environments, we are only proposing a production server. Only one Agilaire agency user maintains a sandbox/test environment, primarily to test their own configuration changes, new sites, etc. Our software architecture, development and test procedures ensure continuity of operation across upgrades (e.g., adding new features is highly separated from and rarely affects existing functionality).

1. Do you have a set of establish templates that assist you in managing projects?

We have an established workflow of milestones (see Schedule), information request forms (which tend to be adjusted for each project’s unique conditions), Project Status reports, templates for software requirement development, and internal tracking system for software development (fixes, enhancements, and contractual enhancements). AirVision also has several configuration reports (sites, parameters, scheduled tasks) to self-document the system, both at completion of implementation, and at any time in the future to document later refinements by IDEM.

* 1. If so, can you provide them?

Many of the above items were provided in our proposal. (Attachment F includes examples of the Project Status Report and a requirements document). Examples of other items (information request templates, software requirements) could be provided from other projects (can be discussed during Oral Presentation).

* 1. Are you amenable to using State templates for project management?

We would need to review them and discuss impact on estimated labor hours.

1. Can you provide the SDLC deliverables that were used to support previous LEADS  
   implementations?

See attached (specifications and internal tracking notes for design/development stage) for Clark County. Again, customizations for VA were minimal and did not require a requirements process.

1. Will the proposed team members be fully committed to the project?
   1. What is their percent allocation to the project?

See Attachment F, page 16. Chart duplicated here:

i. Do these percent allocations have hard upper limits?

Dependent on other concurrent projects. We have considerable experience with these replacement projects and so far, all have fallen along predictions, so we consider our estimates accurate. If the question is about our capacity for change orders without affecting the delivery schedule- again, that would depend on other projects running at the same time.

* 1. Do you have another project (involving these team members) that will be concurrently  
     ongoing?  
     i. If so, how will resource constraints be handled among different clients?

We have one other project with a state agency for a much smaller project (6 loggers, 3 direct polled sites, and one minor customization for data import. This project is anticipated to start June 1, however, the schedule to initial server setup and initial site deployments is faster than the IDEM schedule (less project document submittals and reviews). Assuming a July 1 start date for the IDEM project , we anticipate the majority of work for that project to be completed before end of Phase 0 (end of July). This customer will be taking most data import work on themselves, and the web site will not be provided by us, so once the server configuration is completed (mostly automated scripts from their user information), effort will be minimal. There may be some overlap of installations in August, but our multidisciplinary team can support the Project Director with other staff as needed during this small overlap. Also, for the IDEM project, no logger rewiring or changes are in our scope, so once initial telemetry testing and test polling has been completed, the effort level for oversight of site transitions is minimal (we have estimated 2 hours typical per site to review incoming data and assist IDEM personnel performing the cutovers).

1. What resources, capabilities, documentation, and/or time commitments will you need from the  
   State in order to ensure project success?

IDEM’s primary responsibilities will be:

* Provide site / parameter / calibration information in Agilaire-provided ‘fill in the blank’ spreadsheets to be used for server configuration.
* Provide early test environment for more detailed Xpert2 polling testing and assist in explaining undocumented elements of the protocol (e.g., the “short” records, and workable methods for polling operator logs, since several of the commands do not work per the documentation).
* Timely and thorough review of enhancement requirement documents, answers to developer detail questions, etc.
* Full assistance with information on the telemetry system, provide telemetry cut-over and any required testing or troubleshooting of the telemetry links.
* Perform UAT in cooperation with Agilaire project staff.

1. Will subcontractors be limited to the role stated in your proposal?  
     
   Yes, our description of use of the subcontractors is complete. We do not use subcontractors for development on the core AirVision product.  
     
   a. Will subcontractors be trained in implementation?

Subcontractors involved in data conversion will receive focused training on use of the data import tools (and will only access the system via the dedicated Client and limited user accounts). Subcontractors involved in work on the web site will receive focused training on the AgileWeb product and structure, oriented towards their content work as defined in the final requirements worked out with IDEM.

1. Are you able to employ subcontractors for other duties like document/template creation, business  
   intelligence, or other valuable areas, instead of printing?

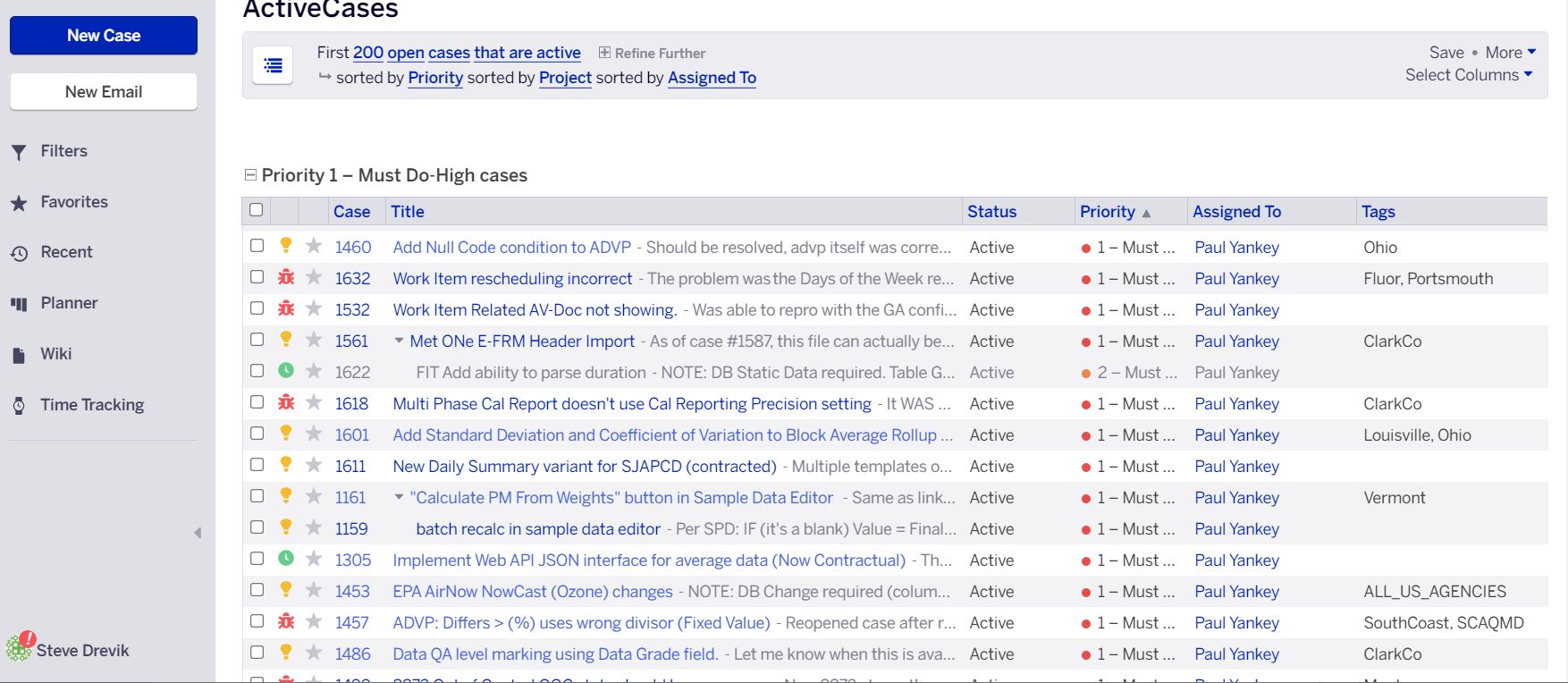
We have not anticipated this requirement/ need, but are open to consideration, pending details.

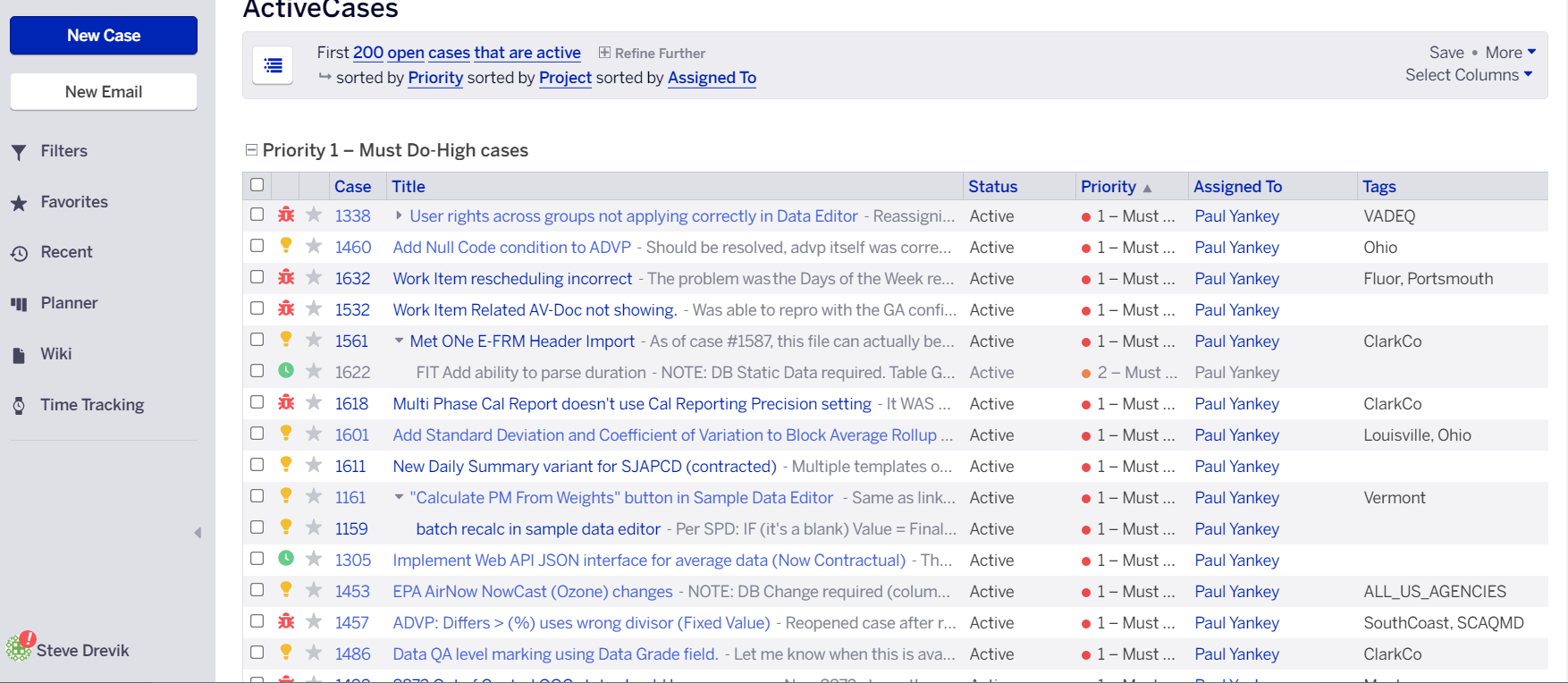
1. The State would strongly prefer hosting in Azure or Amazon Web Services (AWS). Are you able  
   to use a virtual environment for hosting?  
     
   Our hosting model is built around the use of dedicated servers where multi-tenancy issues are eliminated. In additional, our relationship with INAP as a strategic partner gives us excellent response time for support and information requests. We feel that with Azure or AWS, we would be a ‘small fish in a big pond’ and could not offer the level of service required or to our own standards. Also, there are several technical and contractual unknowns in utilizing a new service provider, which would represent risks to the schedule and overall compliance. It could only be considered ‘at the states risk’ for an variations from our proposal due to Azure / AWS environment variables.  
     
   Our product is structured such that server configuration itself is minimal, and restoration is mostly a matter of restoring the SQL database (dependent on database size and transfer method) and installing the application (2 minutes). Our experience with virtualization layers left us feeling that those layers added another point of failure and cybersecurity risk (we ran one such virtualization layer, which was found to have a significant security flaw, after which we have only ever used ‘bare metal’ servers). If the State prefers another hosting environment or virtual environment, we would recommend that IDEM move to a ‘self-hosted’ model.  
     
     
   a. What cost implications would this pose?  
     
   The proposal would need to be changed from SaaS to a license purchase, after which IDEM could host on whatever platform they choose. (It is unclear if it would be a violation of procurement rules to provide a specific cost in this document, but we are ready to do so if needed).   
     
   b. How would you approach data storage in this case?  
     
   IDEM would manage this element of the hosting.  
     
     
   c. If not, where would the system be physically hosted and who would have access to it?  
     
   We use Tier 3 data centers in Dallas, TX with redundant HVAC, power, internet, and SOC2 physical controls.  
     
    i. Do you own and maintain your own server farm or is this outsourced to a third party?  
     
   For reasons listed above, we use a highly experienced, multi-site hosting partner (INAP), which we have used for > 10 years, with excellent support, and no unanticipated server downtime or issues (other than the aforementioned virtualization layer experience). It is worth noting that even during the 2021 Texas “freeze” event, which took down major elements of the ERCOT grid for weeks, none of our INAP systems in the Dallas data center were affected.  
     
   ii. Would the State (i.e., IDEM) own the system and its physical location?  
     
   The hosted system proposal uses the hosting partner (INAP) and is quoted as an SaaS service. We can propose an option for license purchase, which would be the approach if IDEM wanted to host via Azure / AWS or own the physical location.  
     
   (If the question is if IDEM wants to directly contract with INAP, we can consider that- of course, issues of who would have authorization to manage emergency server access, restore, etc could get complicated- we would need to bring INAP into the conversation to ensure how our arrangement would be structured so as not to violate their SOC2 controls).
2. Please confirm that the State has sole ownership of data and will have access to all data.

Confirmed. In the event the State ever wished to terminate the agreement, Agilaire would provide a full backup of the SQL database, which contains extensive ‘flat table’ database views to easily export or query averages, calibration data, non-continuous data, annotations, logbooks, etc. We would provide technical assistance for data extraction or migration as needed for the remainder of the support agreement, and at standard rates thereafter if needed (standard transitional terms for all hosting contracts we have seen).

1. In the future, could the system support a larger amount of data?

Yes, we would only need to review the hosting environment vs. the anticipated data growth. While we have customers with 500GB databases running without issue, unlimited growth / size is never a plan, and some tasks would be added for index maintenance and purge/archive of data beyond periods normally required for retention and QA. For example, most of our agency customers keep hourly and QC check data indefinitely, while fine resolution (1-minute / 5-minute data other than 5-minute SO2) tends to be archived and purged when older than 18 months, allowing time for annual reconciliation.

1. What further information do you need to develop a proposal for the five base requirements that  
   were not factored into the Cost Proposal?  
     
   See “Proposed PM Lab Functionality Discussion” later in this document for a discussion of possible interpretations, options, and questions for those requirements.
2. What tool will you use for tracking throughout implementation and on-going support?  
     
   Project status is tracked through a mutually shared Project Status Report (see Proposal, Attachment F). Software development status is tracked through our internal web-based system used to track all issue/fixes, product enhancements, and contracted customizations.  
    *Example, you can see elements of contracted customizations (SJAPCD report), fixes, and enhancements:*

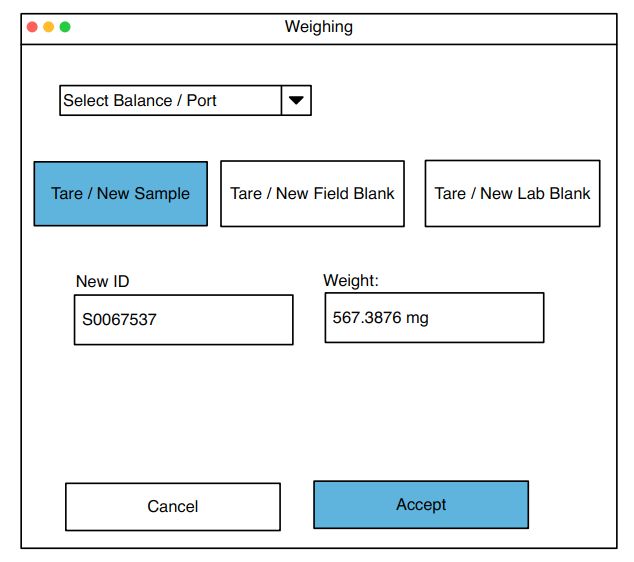


**Proposed PM Lab Functionality Discussion**

Purpose

This section attempts to address possible designs for PM Filter Lab Data requirements of Attachment F1 by proposing possible interpretations, design ideas, and follow up questions to further refine the requirements to a level capable of estimating enhancement labor hours/cost.

1. “Communicate with more than 1 Mettler Toledo Balance”

  
There are certainly a very wide range of MT balances, some using varying protocols, so the first critical piece of information is to know what models are used by IDEM. In our RFI response, we had reviewed the XP protocol (which is extensive and includes various configuration commands; we would not propose to manage the configuration of the balances, only to issue simple weighing commands). Most balances use “W” for weigh or “S” for send stable weight value. Is this the limit of our scope in communication? Do we need to support “zero” commands? Or any other functionality other than bringing in tare weight and final weights.  
  
What are the platforms to be used by IDEM? This functionality would be integrated in with the Client, so we assume the lab would use a PC that would run the AirVision client.  
  
Does “communicate with multiple balances” mean that one PC in a lab might be connected to multiple balances on multiple serial ports? Or that different users / sessions might be using different balances in different labs? Is the COM port static, or would it need to be something the user can select dynamically when they are weighing?  
  
Roughly our approach would be to add a button to the form “Weigh Now” that would prompt the user possibly to select the balance / COM port if needed, and they could select if they are doing a tare weight or a final weight. The RFP did not reference scanning a bar code, we expect this is the point at which the ID would be generated and the label would be printed or noted as ‘to be printed’ (see #3 below).

The Metler protocol documents do not always provide examples of outputs, only commands, so some testing work would need to be done via remote access to a PC with RS-232 port (we can provide, if needed) connected to each balance to be integrated to confirm output formats.

1. “Ability to measure weights and differentiate between sample and QA/QC and recognize when QA/QC is out of range”

Our best guess in regards to this requirement would be either:

* If difference in tare weight and final weight < X, then mark it as a blank (field blank or lab blank? Or query the lab tech in this case)

Does “QA/QC” out of range only mean when a blank has been identified? (and if the method above is used to automatically identify, if difference is > X, it wouldn’t be identified as a blank and the error would not be noted).

It’s possible the intent is that field and lab blanks were be differentiated before weighing (via the file import process, Sample Data Editor), and the requirement is simply to note when difference in weights is > X. What is done as part of “recognition”? Just alert the lab tech in the form? Null code the blank record? Both?

Are there any other definitions of ‘out of range’ other than tare/final weight differences?

1. “Ability to track data by site and date and generate unique scannable barcode for each sample”  
     
   “Track data by site and date” – the AirVision system sample (non-continous) data record has fields for site/parameter, date, and Sample ID (which all form a primary key). Typically, records are initially created from run data downloaded from Partisol samplers (creating the information with sample ID, date, time, site, as well as meta data – flow, pressure, temp, etc).   
     
   However, in this case, to generate a barcode for the sample, we believe the intent (and stated in our original RFI response) is that AirVision should generate a unique sample ID (possibly when doing initial weights… see #1 above) and print labels (Avery 5161/8161 via standard 8.5 x 11 printer page). We assume Code 128-A as the barcode method.  
     
   Obviously, there are some issues in printing based on the pop-up / weigh screen (each pop-up weigh is one label, while printing is a range of labels), so it’s quite possible the pop-up needs to just generate the IDs, and a separate function is given to select/print of a range of IDs to This would likely be a separate form from the Sample Data Editor (as it is more like a report), but a ribbon button might ‘hot link’ to the report (e.g., “Print Labels” function on ribbon).  
     
   We assume field blanks and lab blanks may need a distinguishing part of the sample ID (e.g., “F” or “L” in front of the numeric ID).   
     
   
2. “Shall have automatic error checking. For example, the air DMS shall alert the user when recorded weight from the balance is not received/recorded.”  
     
   “Error checking” must be defined if other than “weight not received / recorded.” (e.g., what other error checks need to be coded? Note that the Sample Data Editor does visually denote samples > 3 day sample interval or warm/cold pickup delays if pickup time is imported via File Import Tool).  
     
   Our assumption is that tests do not need to be logged historically, but this capability (and a report) can be added during requirements / enhancement negotiation phase.
3. “Shall have the ability to prompt the technician to weigh standards, re-weight,and control samples at designated intervals”

Addendum 1 of the RFI clarifies that the balance is to be checked against a standard every 10 filters. Requirements needs to be defined if there is ‘carryover’ of the count between weighing sessions, or perhaps more simply each session would likely start with a standard). We propose that each session would start with the weighing of a standard, and a notification provided after each 10 weighing in the same session. If each balance has a different standard, an editor would need to be provided to enter the standard values, and at each session, the user will have to pick which standard they are using.

Once prompted, the user will use the button / hotkey, and if out of range, an error message will be given on the screen. The definition of ‘out of range’ for a standard weighing should be defined (e.g., % of standard weight or < X ug?).

**Details for Question 14 – Example Requirements and Change Tracking**

Unusual Indicator Report:

The unusual indicator report enhancement would summarize hourly data for a selected list of sites and parameters, based on logical tests listed below. The report would present the data as a single list, sorted by site name first (alphabetical), then by the order of the logical tests below, and then by parameter name (or report order) within those logical tests. No page break would be given site, so that data could be exported into CSV/Excel more easily.

**Logical Tests:**

1. The report will search all 8872 calibration programs for that site, checking the start time in the server and repeat interval, to determine if (and how many) calibration sequence was to have occurred in the report period. Start times will be searched explicitly by minute (e.g., if supposed to have run at 12:45, the report will search for records from 12:45:00 to 12:45:59). If a calibration is missing, it will be reported as follows *(Start = expected start time):*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Exception** | **Site** | **Parameter** | **Details** | **Start** | **End** | **Value** |
| QC Check Missing | North |  | DLY\_PREC | 12/17/20 01:45 |  |  |

1. For each sequence that runs, the results of each parameter will be checked against the Expected (target) value recorded in the calibration record, and the difference checked against the Drift Limit (either as a %, or an absolute difference, user-selectable). For each parameter/check that exceeds this limit, it will be reported as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Exception** | **Site** | **Parameter** | **Details** | **Start** | **End** | **Value** |
| QC Failed | North | SO2 | DLY\_PREC: ZERO | 12/24/20 01:45 | 12/24/20 02:30 | 33.45 |

1. Instruments marked invalid by the logger (<) for any reason other than calibration (C) will have the outages grouped into based on the highest priority flag, and then sorted into consecutive hourly groups with that same flag. Each group will be listed as an event with a starting and ending time of the event.  
     
   e.g., if SO2 is marked as Overrange for hours 00-10, and also marked Maintenance for Hours 08-12, and Overrange is higher priority than Maintenance, the outages will be reported as follows (value is the average of the event):

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Exception** | **Site** | **Parameter** | **Details** | **Start** | **End** | **Value** |
| Invalid | North | SO2 | Overrange | 12/25/20 00:00 | 12:25:20 09:00 | 533.4 |
| Invalid | North | SO2 | Maintenance | 12/25/20 10:00 | 12:25:20 12:00 | 33.1 |

1. *“Data not coming into the server” is managed by the* ***Overall Site Summary Report****,   
    and is not addressed in this report.*
2. Parameters with the parameter template SITE\_TEMP will be checked for H (high) and L (low) flags, and consecutive groupings of hours with those flags will be reported as follows (value is the average of the event):

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Exception** | **Site** | **Parameter** | **Details** | **Start** | **End** | **Value** |
| Invalid | North | Shelter Temp | High | 12/25/20 00:00 | 12:25:20 09:00 | 29.7 |
| Invalid | North | Shelter Temp | Low | 12/25/20 10:00 | 12:25:20 12:00 | 12.1 |

1. Parameters with parameter template SWSP, WSDR, VWSP, or VWDR that report the same value (within 1%) for 2 or more consecutive hours will be reported with the value (average of the event) as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Exception** | **Site** | **Parameter** | **Details** | **Start** | **End** | **Value** |
| Stagnant | North | VWSP | Sustained >= 2 hrs | 12/25/20 00:00 | 12:25:20 09:00 | 0.0 |
| Stagnant | North | VSDR | Sustained >= 2 hrs | 12/25/20 00:00 | 12:25:20 12:00 | 180.0 |

1. Parameters with parameter template SWSP or VWSP that report an H flag for 2 or more consecutive hours will be reported with the value (average of the event) as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Exception** | **Site** | **Parameter** | **Details** | **Start** | **End** | **Value** |
| Gust | North | VWSP | Sustained H >= 2 hrs | 12/25/20 00:00 | 12:25:20 09:00 | 55.4 |
| Gust | North | SWSP | Sustained H >= 2 hrs | 12/25/20 00:00 | 12:25:20 12:00 | 52.1 |

1. All other data conditions would be managed by reporting data marked with the suspect (?) flag by the Automated Data Validation Processor during the report period, and will be reported as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Exception** | **Site** | **Parameter** | **Details** | **Start** | **End** | **Value** |
| Suspect | North | NO2 | Suspect by ADVP | 12/25/20 00:00 | 12:25:20 09:00 | 11.7 |
| Suspect | North | NO2 | Suspect by ADVP | 12/25/20 10:00 | 12:25:20 12:00 | 2.1 |

*This report would be downloadable in various formats (CSV, Excel with additional formatting cells, PDF, RTF).*

*There will not be a provision to drill down from the report to data editor, as this is not feasible with a report such as this. Our report generation tools allow for some embedding of HTML links in web-only reports (like we have proposed for the Annual AQI report), but (a) instances of the Average Data Editor in the Client cannot be spawned via HTML link and (b) doing so would eliminate the option of having the report in the Client, which we felt was still important. thus, no ‘drill down’ can be offered.*

*We had recommended using ADVP rules that would mark data suspect, which could allow for easy filtering in the data editor as an alternative. Those rules can still exist for some data checks alongside this report:*

* *Conditions 3 & 4 can be found easily in the Data Editor using filters on the Flag field.*
* *Rules 5 & 6 can be tested with variance checks in ADVP and set suspect flag for easily filtering/search in the Data Editor*
* *Rule 7 just refers to future rules in ADVP using the suspect flag.*

*Note also that this report does not ‘mark’ data in any way in the editor. Application of flags and null codes would be manually through the data editor in response to the report and review by QA personnel. Again, ADVP rules could do some flagging/coding (e.g., site temperature)*

Software Tracking Report; Clark County - Unusual Indicators Report

Project: [General AirVision/AVTrend/8872 Dev](https://agilaire.fogbugz.com/f/filters/?fClosedBugs=false&ixProject=4&sSorts=Priority-Project-Milestone)

Area: [Misc](https://agilaire.fogbugz.com/f/filters/?fClosedBugs=false&ixArea=9&ixProject=4&sSorts=Priority-Project-Milestone)

Milestone: [Version 4.0 Revisions](https://agilaire.fogbugz.com/f/filters/?fClosedBugs=false&ixFixFor=13&ixProject=4&sSorts=Project-Milestone-Priority)

Priority

 1 – Must Do-High

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Opened by [Steve Drevik](https://agilaire.fogbugz.com/f/personInfo/activity/2)

[10/11/2020 7:43 PM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.10684)

[Requirements\_UnusualIndicators.doc](https://agilaire.fogbugz.com/default.asp?ixAttachment=698&pg=pgDownload&pgType=pgFile&sFilename=Requirements_UnusualIndicators.doc)

Assigned to [Susan Hoyle](https://agilaire.fogbugz.com/f/personInfo/activity/6) by [Steve Drevik](https://agilaire.fogbugz.com/f/personInfo/activity/2)

[10/11/2020 7:43 PM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.10685)Assigned to [Paul Yankey](https://agilaire.fogbugz.com/f/personInfo/activity/5) by [Susan Hoyle](https://agilaire.fogbugz.com/f/personInfo/activity/6)

Notified Steve Drevik.

[12/14/2020 3:36 PM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.10937)

For Invalid exception, the C flag and E flag are not included.  
  
For "QC Failed", is the value the raw value or the report value?  
  
Details for Invalid is flag descriptor.  
  
"QC Check Missing" will not search for disabled sequences.

Assigned to [Susan Hoyle](https://agilaire.fogbugz.com/f/personInfo/activity/6) by [Steve Drevik](https://agilaire.fogbugz.com/f/personInfo/activity/2)

[12/14/2020 4:10 PM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.10938)

For QC failed, I'm not sure what you mean... there's the cal result (vs the expected value), but I guess the question is using rounded or unrounded when doing the error calculation?  If so, use the same method we use in the Cal Results report (which may be controlled by Utility Setting?).  
  
What is "Details for Invalid is flag descriptor"?  
  
Understood on the others.

Assigned to [Steve Drevik](https://agilaire.fogbugz.com/f/personInfo/activity/2) by [Susan Hoyle](https://agilaire.fogbugz.com/f/personInfo/activity/6)

Notified Paul Yankey.

[12/14/2020 4:46 PM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.10940)

Actually, the "use raw or report value" applies to Invalid exceptions(instruments marked invalid by the logger) not failed calibrations. Currently, for Invalid exceptions, the average is created from report values.  
  
For Invalid types(instruments marked invalid by the logger) the column in the report, "Details", uses the flag descriptor. It's just a clarification.

Assigned to [Paul Yankey](https://agilaire.fogbugz.com/f/personInfo/activity/5) by [Steve Drevik](https://agilaire.fogbugz.com/f/personInfo/activity/2)

[12/14/2020 4:53 PM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.10941)

All sounds good.  Thanks.

Assigned to [Susan Hoyle](https://agilaire.fogbugz.com/f/personInfo/activity/6) by [Paul Yankey](https://agilaire.fogbugz.com/f/personInfo/activity/5)

[01/06/2021 12:59 PM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.10961)

Tested with build from 2021.01.05

Item 5 did not test out.  Tried with flags l,h,L,H on a parameter with a template of SITE\_TEMP assigned.  Flagged hours did not show up in the report.

Item 7 did not test out.  Tried with h and H flags on two consecutive hours with parm using template SWSP and VWSP.

Assigned to [Paul Yankey](https://agilaire.fogbugz.com/f/personInfo/activity/5) by [Susan Hoyle](https://agilaire.fogbugz.com/f/personInfo/activity/6)

[01/06/2021 5:00 PM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.10970)

The report uses the Highest Flag. I was not able to duplicate your tests until I added a flag that was of a lower priority than 'E'. A data value with flags of 'EL' will be ignored, for instance.

Assigned to [Susan Hoyle](https://agilaire.fogbugz.com/f/personInfo/activity/6) by [Paul Yankey](https://agilaire.fogbugz.com/f/personInfo/activity/5)

[01/08/2021 2:33 PM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.10974)

Discussed with Steve and based on the specs with customer, the H and L flags need to be represented in the report (based on the criteria noted in items 5 and 7) even if they are NOT the highest priority flag.

Assigned to [Paul Yankey](https://agilaire.fogbugz.com/f/personInfo/activity/5) by [Susan Hoyle](https://agilaire.fogbugz.com/f/personInfo/activity/6)

Notified Steve Drevik.

[01/14/2021 5:40 PM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.10985)

Added procedure which uses RawLoggerFlags for H and L flags instead of HighestFlag for SITE\_TEMP (Item #5), and SWSP or VWSP types (Item #7). If the H or L flags for these parameters are also the highest priority flag, the exceptions will be repeated (see Item #3), as acknowledged:  
  
"There may be overlap, yes (although H and L do not normally invalidate data, so if it showed up in #3, it would be due to another issue, and one would hope that an invalid data flag condition (e.g., B, M, etc) would have higher priority over an informational flag like H and L.  That's the system default, at least. " -Steve

Assigned to [Susan Hoyle](https://agilaire.fogbugz.com/f/personInfo/activity/6) by [Paul Yankey](https://agilaire.fogbugz.com/f/personInfo/activity/5)

[01/21/2021 10:46 AM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.10994)

Please confirm check in of the refereneced new proc.  I am not picking one up when doing a database diff between a 1/5 build and 1/21.

[1 revision](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report)Edited by [Susan Hoyle](https://agilaire.fogbugz.com/f/personInfo/activity/6)

[01/21/2021 4:02 PM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.10995)

Perhaps a misunderstanding? The new procedure is part of the UnusualIndicatorReportProcessor which has been checked in.  
  
-- LATER CONFIRMED AS CHECKED IN.

Resolved (Implemented) and assigned to [Steve Drevik](https://agilaire.fogbugz.com/f/personInfo/activity/2) by [Susan Hoyle](https://agilaire.fogbugz.com/f/personInfo/activity/6)

Status changed from 'Active' to 'Resolved (Implemented)'.

[03/05/2021 5:33 PM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.11093)Closed by [Paul Yankey](https://agilaire.fogbugz.com/f/personInfo/activity/5)

[04/12/2021 1:43 PM](https://agilaire.fogbugz.com/f/cases/1552/Contracted-Clark-County-Unusual-Indicators-Report#BugEvent.11183)