VHS SMP RIXES RESPONSES

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1 RIXES on each section of the Survey Management Plan

1.1 VHS SMP review – Rix#02

RID=Review Item Discrepancy, RIC=Review Item Comment, RIQ=Review Item Question
Please use a separate page per RIx.

Reviewer: ESO Survey Team	
Document No	VHS SMP
RID, RIC or RIQ ?	RID
Section	Survey Observing Strategy
Page(s)	

RIx text

1. The PI must prioritize the survey regions: The high priority area must be complementary as much as possible in the R.A. distribution to the other OPC recommended public surveys, i.e. VVV, VMC, and VIKING. The PI should investigate synergies with the PI of these surveys so that data can be shared.

2. Only 1 tile for 1 OBs is allowed so the current observing strategy must to be revised.

3. According to the ESO policies for Service Mode Observations (which will apply to VISTA observing) the exposure time cannot be adjusted at the telescope.

4. The Ks sky background is substantially stable at the Paranal Observatory, see ISAAC QC pages. For the bluer filters, it depends on the FLI.

5. The tradeoff between sky transparencies and seeing FWHM requirements is the PI responsibility, and cannot be delegated to the night astronomer.

6. PI should use SADT to avoid bright stars in their tiles.

7. OBs for different instrument cannot be linked, therefore no link is possible between VHS OBS and VST ATLAS OBS.

8. The survey team underestimates the number of nights required to complete their survey and consequently overestimate the total area covered within a certain time interval, as they do not take into account i) the time required to point the telescope, and ii) the one hour needed to calibrate the broad band filters, as described in the VISTA calibration plan.

Reply from Survey Team
Name: Richard McMahon

1. On enquiring about the granularity of the priories the EST provided the following guidance:

   "*Concerning the priority of the different survey regions, the goals of the PSP are:*

   - *to allow VVV, VMC and VIKING to take advantage of the best observing conditions.*
   - *within a given RA range, the "granularity in priority" required should consider both of the following: i) a relative ranking between the 3 VHS components; ATLAS, DES, GPS and ii) hourly in RA.*
   - *Also the PSP seemed happy with 3 to 5 priority levels"*

   See Table 3 in the revised VHS SMP(v1.0) for the coarse high level priorities. In addition we shall supply finer grained priorities for specific regions of sky within each survey e.g. by declination stripe for the VHS-DES and VHS-ATLAS components or galactic *l, b* with seeing limits that take into account stellar confusion.

   We plan to update the priority for specific OBs in the VHS-ATLAS region prior to each observing period and at intervals within a period based on the progress of the VST-ATLAS survey.

2. The OB strategy that contains multiple tiles within an OB has been replaced by concatenated OBs.

3. We will use OB prorities and observing condition constraints to manage this.

4. Analysis by Riello(2007, ESO Calibration Workshop, http://www.eso.org/gen-fac/meetings/cal07/presentations/Riello.pdf) for WFCAM data finds that the J, H sky varies as a function of elapsed time after astronomical twilight.

5. We will use OB prorities and observing condition constraints to manage this.

6. This issue that is raised in the VHS SMP v0.5 in section 2.2.5 is that we need to quantify the effects of bright stars in advance of submitting OBs. We need to determine in advance what magnitude of star needs to be avoided using the SADT. We would like the effects of bright stars to be investigated during the Public Survey Science Verification phase.

7. We shall attempt to facilitate this requirement via the modification of OB priorites as described in 1 above.

8. (i) No information about the time required to point the telescope was available at the

time of submission of the VHS SMP in February, 2007. Actual overheads can be computed by the EST using the information provided in the SMP when the actual observing overheads have been measured and will depend on what actions can be carried out in parallel. e.g. filter changes while moving the telescope; writing to disk while moving between jitters and tile centres in concatenated OBs.

Assuming 1 Tile per OB, the total number of OBs required for VHS is (3485*4 + 3136*3 + 5714*.2) = 34,776. If additional overheads of 1min per OB are required an additional 580 hours will be required to be added to the overheads of 1193 hours that are included in the time estimate in Table 1 and result in a total time requirement of 3982 hours and an average observing efficiency of 55%. The VHS team is keen to collaborate with the EST on the determination of an optimal observing strategy that reduces the survey overheads.

(ii) The VHS survey does not require the hourly observations of standard stars as described on page 31 in Section 5.4 of the v1.4pre1 of the VDFS VIRCAM calibration plan. The VHS requirement is to photometrically calibrate VIRCAM data to 2%. VHS photometric calibration will use 2MASS to carry out the photometric calibration of each VHS tile in YJHK using the 2MASS JHK stellar photometry following the VDFS procedures developed for the WFCAM instrument and the UKIDSS LAS survey by Hodgkin et al(in preparation). The requirement on VDFS is to photometrically calibrate WFCAM and VIRCAM data to 2%. Nikolaev et al. (2000) claim that the 2MASS all-sky point-source catalogue has photometry that is globally consistent to 1%.

1.2 VHS SMP review – RIx#03

RID=Review Item Discrepancy, RIC=Review Item Comment, RIQ=Review Item Question
Please use a separate page per RIx.

Reviewer: ESO Survey Team	
Document No	VHS SMP
RID, RIC or RIQ ?	RID
Section	Survey Data Calibration Needs
Page(s)	

RIx text

1. The Y band cannot be calibrated with 2MASS, and the survey team does not discuss a calibration plan for this filter.

2. The team has not investigated the impact of the 200 bad pixel region on chip#16 for their science.

3. As part of their quality control tests, the survey team expects to test the galaxy-star classification during Science Verification (SV): does the survey team have a backup plan is the SV time is not available?

Reply from Survey Team
Name: Richard McMahon

1. The Y filter will be calibrated using 2MASS JHK stellar photometry following the procedures developed for the WFCAM instrument and the UKIDSS LAS survey by Hodgkin et al(in preparation). The requirement on VDFS is to photometrically calibrate WFCAM and VIRCAM data to 2%. Nikolaev et al. (2000) claim that the 2MASS all-sky point-source catalogue has photometrythat is globally consistent to 1%. Independent checks on 2MASS based Y calibration will be carried out using the Skymapper z band photometric survey and 2MASS J band via interpolation.

2. The effects of the bad pixel regions will be recorded in the VDFS confidence maps and detected sources that are in the vicinity of spatially fixed artifacts can be flagged in the source catalogues.

3. Our backup plan is to use SDSS and other spectroscopic classifications. For instance SDSS used the COMBO survey classifications see: http://www.sdss.org/dr5/products/general/stargalsep.html

1.3 VHS SMP review – RIx#04

RID=Review Item Discrepancy, RIC=Review Item Comment, RIQ=Review Item Question
Please use a separate page per RIx.

Reviewer: ESO Survey Team	
Document No	VHS SMP
RID, RIC or RIQ ?	RIQ
Section	Survey Reduction Process
Page(s)	

RIx text

1. Who checks the uniformity of zero points across the whole survey area and the global astrometry?

2. When submitting the revised SMPs, the PI must provide a written statement from both CASU and WFAU managers that the two data centers will support the data flow and the data processing needs as described by the PI in the VHS Survey Management Plan.

Reply from Survey Team
Name: Richard McMahon

1. These will be checked by the VHS team via comparison with 2MASS and also via a comparison of photometry and astrometry for sources that are detected in more than one tile.

2. This RIX seems to be the same as RIX#5.5. See enclosed statement from CASU and WFAU managers

1.4 VHS SMP review – RIx#05

RID=Review Item Discrepancy, RIC=Review Item Comment, RIQ=Review Item Question
Please use a separate page per RIx.

Reviewer: ESO Survey Team	
Document No	VHS SMP
RID, RIC or RIQ ?	RIQ
Section	Manpower and hardware capabilities devoted to data reduction and quality assessment
Page(s)	

RIx text

1. There are no FTE committed to the survey data processing in addition to those of VDFS: the survey team must provide a detailed break-down of the FTE commitments in the revised management plan.

2. A required deliverable will be a photometrically and astrometrically uniform survey: once the survey team gets the basic stacked data from CASU, who will be carrying out this part of the data processing and quality control?

3. Creating a uniform ZP and global astrometry over several thousands squared degrees is a major undertaking and it is a key to their science. If WFAU is expected to do this, then the PI must provide a written statement by WFAU that they confirm to do this for VHS. Otherwise, the PI must provide detailed FTE for those parts of the data processing and the scientific analysis which is specific for the science goals of the survey in the revised survey management plan.

4. The team should have a person responsible for preparing the survey OBS.

5. When submitting the revised SMP, the PI must provide a written statement from both CASU and WFAU managers that the two data centers will have the sufficient FTE commitment to support the data flow and the data processing needs as described by the PI in the VHS Survey Management Plan.

Reply from Survey Team
Name: Richard McMahon

1. The VHS data processing does not require a substantial level of post-VDFS pixel level processing. The main tasks are band merging and verification, validation and quality assurance of the VDFS products. The VHS team will carry out QA on the CASU pipeline products prior to the VSA band-merging and further QA after the band-merging is carried at WFAU. The PI and other member of the VHS who have worked with UKIDSS data have considerable experience in this area. A recent example of post WFAU QA carried out by the VHS PI resulted in a re-release of the UKIDSS LAS DR2 see http://surveys.roe.ac.uk/wsa/pre/releasehistory.html

2. The CASU pipeline products are photometrically and astrometrically globally calibrated onto 2MASS following the techniques developed for the VISTA Data Flow System for the WFCAM UKIDSS data. The VHS team will primarily be involved in verifying this and identifying tiles that fail to meet the astrometric and photometric science requirements.

   The VHS quality control process will include identifying datasets where the pipeline has under performed in some clear manner and feeding information back to the CASU group so that an investigation of what went wrong can be put in place. If the pipeline is clearly at fault then early reprocessing with modified pipeline components will take place.

   The quality control process will also consist of identifying datasets where the observations were carried out incorrectly, e.g. Appropriate calibration files were not available, or in observing conditions that result in data that fail the VHS science requirements. Such datasets that cannot be fixed by altering the pipeline and will need to be re-observed with appropriate changes to the observing strategy

3. See response to 2.

4. The PI shall be initially be the point of contact for this task. A working group from within the VHS team shall carry out this task. 1.5 FTE of effort has been identified from the groups at Barcelona, Cambridge, IAC, Heidelberg, IAC and Queen Mary. Our provisional plan to to separate the OBs into three sub-surveys as outlined within the SMP. It may be prudent to have more than one P2PP accounts to allow this, bearing in mind the large number of OBs (~35,000) that will have to be generated over the nominal 5 year lifetime of the VHS.

5. This seems to be same as RIX#4.2. See enclosed statement from CASU and WFAU managers

1.5 VHS SMP review – RIx#06

RID=Review Item Discrepancy, RIC=Review Item Comment, RIQ=Review Item Question
Please use a separate page per RIx.

Reviewer: ESO Survey Team	
Document No	VHS SMP
RID, RIC or RIQ ?	RIQ
Section	Data quality assessment process
Page(s)	

RIx text

1. Can the PI clarify who sets the extraction parameters for the source catalogues? Where do the science requirements come into place? Or the PI involvement?

Reply from Survey Team
Name: Richard McMahon

1. The extraction parameters were initially developed as part of the science requirements analysis by the UK community for the VISTA pipeline and the UKIDSS surveys. The PI and many other members of the VHS team were involved in both these processes. In the case of the UKIDSS surveys the ESO community has also been involved.

   The current set of parameters will be reviewed during the period when VHS is being carried out, to ensure that the VHS parameter set are consistent with the parameter sets for VST ATLAS and DES. A copy of the current parameter is defined in the VDFS document VDF-SPE-IOA-00009-0001v4(Irwin, 2007) and is available at this URL:
   http://www.ast.cam.ac.uk/~rgm/vhs/smp/WFCAM-catalogues-v4p0.pdf

1.6 VHS SMP review – RIx#07

RID=Review Item Discrepancy, RIC=Review Item Comment, RIQ=Review Item Question
Please use a separate page per RIx.

Reviewer: ESO Survey Team	
Document No	VHS SMP
RID, RIC or RIQ ?	RIQ
Section	Data products and VO compliance
Page(s)	

RIx text

1. The aperture matched photometry must be delivered to the ESO archive.

2. Will the DES optical data be available to the community?

3. Will the high level data products – photo-z, etc. – be available for the ESO archive?

4. If all data processing steps are performed by VDFS, and ESO receives the VO compliant data products from there, what is the team added value?

Reply from Survey Team
Name: Richard McMahon

1. Aperture matched photometry is part of the VDFS deliverables and will be delivered to the ESO archive.

2. The DES optical data will be available to the community.

3. The generation of photo-z's requires the federation of the VHS data with VST ATLAS or DES observations. At this time the VHS is cannot guarantee a delivery timescale for these products but will endeavour to delivery photo-z's the archive.

4. The VHS consortium will carry out the preparation of the VHS OBs, verify the state of OB's have been executed and update P2PP with new OBs and changes to OBs throughout the survey. The VHS team will assess whether pipeline processed OBs meet the VHS science requirements. The VHS team will carry out verification, validation and quality assurance of the VDFS products and specify when the products are ready for delivery to ESO. This work will include characterizing the effects of artifacts in the data.
   Section 6.3 of the submitted SMP lists a range of VHS quality control and assurance tasks.

   The PI and other member of the VHS who have worked with UKIDSS data have considerable experience in this area. A recent example of post WFAU QA carried out by

the VHS PI resulted in a re-release of the UKIDSS LAS DR2 see
http://surveys.roe.ac.uk/wsa/pre/releasehistory.html

The VHS consortium will define and agree in consultation with the VDFS team(s), QC criteria that can be applied to the VDFS VISTA data products in advance of preparing data releases to the ESO SAF.

The QC criteria and thresholds will be communicated to the VDFS via the VHS consortium primary point of contact. In practice the QC work may involve one of more individuals from a VHS consortium working closely with one or both of the two VDFS groups.

All of the Cambridge pipeline QC information will be available to VHS via a QC database in Cambridge (for an example see http://casu.ast.cam.ac.uk/surveys-projects/wfcam/data-processing/)
and is also recorded in the data product FITS headers. The VHS team will analyze and monitor this QC information.

The VHS quality control process will amongst other things consist of identifying obvious datasets where the pipeline has under performed in some clear manner and feeding information back to the CASU group so that an investigation of what went wrong can be put in place. If the pipeline is clearly at fault then early reprocessing with modified pipeline components will take place.

The quality control process will also consist of identifying datasets where the observations were carried out incorrectly, e.g. appropriate calibration files were not available, or observations carried out in poorer conditions that specified in the OB constraints. Such datasets cannot be fixed by altering the pipeline may need to be reobserved with appropriate changes to the observing strategy. Note that the catalogue generated QC information will help to pick out the cases where the pipeline processed products fail the VHS QC but at some level of visual inspection will also be carried out. The VDFS WFCAM pipeline DQC and survey progress graphical interface is available at this URL:
http://casu.ast.cam.ac.uk/survey-progress/wfcam/

The Archive quality control process itself will consist of a data modification script coded up manually by the VDFS science archive staff based on the QC criteria specified by the VHS consortium. Example QC plots and further information can be found in Dye et al., MNRAS, 372, 1227 (2006) and Warren et al., MNRAS, in press (2007; astro-ph/0610191). Quality Control issues currently implemented in the WFCAM Science Archive can be viewed at this URL:
http://surveys.roe.ac.uk/wsa/www/gloss_d.html - lasdetection_deprecated

In order to maxmise the legacy value of the VHS survey the VHS team plan will publish peer reviewed scientific papers and also an online Explanatory Supplement modeled on the 2MASS Explanatory Supplement:
http://www.ipac.caltech.edu/2mass/releases/allsky/doc/explsup.html

2 Emails from ESO concerning VHS (Nov 2006 to Mar 2007)

2.1 *OPC recommendation on Public Survey programme (email of 29 Nov 2006)*

From: visas@eso.org
Subject: OPC recommendation on Public Survey programme "The VISTA Hemisphere Survey(VHS) "
Date: 29 November 2006 13:37:00 GMT
To: rgm@ast.cam.ac.uk
Cc: visas@eso.org, jmelnick@eso.org, marnabol@eso.org

Dear Dr. McMahon,

We are pleased to inform you that based on the feedback of the VISTA Public Survey Panel, the Observing Programmes Committee has made to ESO the recommendation to implement your Public Survey proposal:

"The VISTA Hemisphere Survey(VHS)"

However please note that final decision about allocation of time to this proposal is subject to review and approval of the associated Survey Management Plan (SMP). The ESO Survey Team will soon send to you the indications about the corresponding submission process.

Best regards,
ESO Visiting Astronomers Department

2.2 Information on SMP process and PSP feedback report (email of 12 Dec, 2006)

2.2.1 Email from EST

From: marnabol@eso.org
Subject: Survey Management Plan - VISTA
Date: 12 December 2006 18:02:52 GMT
To: rgm@ast.cam.ac.uk

Dear Dr McMahon,

Please find the information concerning the Survey Management Plan process and the VISTA Public Survey Panel (PSP) report in the attached document,

Kind Regards

Dr Magda Arnaboldi
ESO -- USD

2.2.2 Enclosed letter from EST.

Dear Dr McMahon,

Following the evaluation by the VISTA Public Surveys Panel, the Observing Programmes Committee has recommended to ESO the selection of your Public Survey proposal:

"The Vista Hemisphere survey (VHS)"

However, please note that the final decision about allocation of time to this proposal is subject to review and approval of the associated Survey Management Plan (SMP) whose objective is to define the information necessary to carry out the Public Surveys in Service Mode. The SMP must define the observing strategy, the survey data calibration needs, the data reduction process, the manpower and hardware capabilities provided by the PI and the survey team, the data quality assessment process, and the data product delivery to the Virtual Observatory (VO).

The guidelines for the preparation of the survey management plan – VISTA and the latex template are now available at: http://www.eso.org/observing/webone.html

The submission, review process, iterations and final approval of the SMP will follow and proceed according to the following timeline:

- The deadline for submission of the SMP by the PIs of the ESO Public Surveys is noon CET on the 16.02.07. SMP is to be sent to the team leader of EST (marnabol@eso.org).
- The EST review ends on the 07.03.07, with feedbacks sent to PIs so that synergies and optimization between surveys can be implemented and the SMP revised.
- Submission of revised SMP by noon CET on the 02.04.07.
- End of SMP review and approval by ESO DG by the end of May 2007.

When preparing your SMP, you must take into account the recommendation of the VISTA public survey panel, which are detailed below. Please note the priority of implementation of your proposal as formulated by the VISTA PSP.

Please do not hesitate to contact me, should you need any additional information,

With Best Regards Dr M. Arnaboldi, ESO – USD

2.2.3 Report by the ESO Public Survey Panel

This proposal was well received by the PSP panel. Survey of the whole southern hemisphere, 1 *[rgm comment; should probably read as ~4]* magnitude deeper than 2MASS will provide a wealth of important scientific results, several of which are well described in the proposal. The authors have improved their original proposal by combining with DES and clarifying the areas that would be covered in the various bands: (a) VHS-DES 120s in JHK, over 4000+ sq. deg., ZY from DES. (b) VHS-ATLAS 60s in YJHK, over 5000+ sq. deg., Z from VST-ATLAS. (c) VHS-GPS 60s in JK, over 8000+ sq. deg., 5<b<30 galactic latitude (not including areas covered by the Sutherland, Minniti, Cioni proposals). The panel welcomed the letter from the DES director and the offer to image that area in the Y-band.

Observing Strategy

This is the only public survey that will take advantage of relatively poor seeing in the range 1 to 1.5 arcsec.

The team should revise the observing strategy considering that VISTA can observe 10 hrs per night on average.

Management

This proposal has a rather generic description of the data handling aspects of the program, which is a concern, given the amount of data that this survey project will collect and the complicated data reduction required in this study. This must be addressed in greater detail in the SMP.

VISTA PSP ranking

VISTA PSP recommends this program with rank 1/6. We ask to carry out this program for 5 years, and the VISTA PSP will follow the yearly review and may request to modify strategy to

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