In opening, please note that I make this submission under the conditions of anonymity. I do this because I must work under the rules and regulations set by the QSA and I have children currently in the system.

My details:

I have been a secondary school teacher since the start of 1988. For every one of those years I have been a teacher of senior Mathematics and in all but three of those years of Physics as well. During this time I have taught in both the state and non-state system, in a small country town and in a large regional city. I currently teach in a large non-state school. I have been in the past a member of district panels for Maths C and Physics. I am currently a member of a Physics district panel.

"The terms of reference for the inquiry include:
That, in undertaking this inquiry, the committee should consider the following issues:

- Ensuring assessment processes are supported by teachers
- Student participation levels
- The ability of assessment processes to support valid and reliable judgments of student outcomes."

I shall respond as best I can to the three main terms of reference.

1. Ensuring assessment processes are supported by teachers

This can only happen when teachers who at the end of the day will be forced to implement assessment processes, are an integral part of the system. QSA claims this but, as with much of what QSA claims the evidence appears to be lacking. If something is to be supported by the end users they need to be convinced that it will (a) work, (b) do a better job then what they are currently using and (c) that the benefits outweigh any inconvenience that might be caused. QSA singularly fails on all counts. The approach is top down and command driven, and in a word "arrogant". I give as evidence the process by which the current Physics syllabus was developed. A trial pilot was started. This lasted for about 6 years (2001 -2007) during which time there was considerable resistance in the trial pilot schools and some changes were made (a good thing), but the basic ideology was never going to change because QSA knows best. In the lead up to the final edition coming out we had on an almost weekly basis the number of criteria changing: oscillating between 2 and 3 main criterion. Why? Who knows? I'm lead to believe that the final decision was made "as from on high" by the upper powers of QSA and that was that! I note that the governing body of the QSA has provision for only two actual teachers (that is people that teach and have to implement QSA policies) one from the primary sector and one from the secondary sector (which is present vacant). How can such an unrepresentative body make decisions that affect such a large group of people yet those people have almost no representation in the decisions that they will be forced to implement. Such mechanisms will hardly engender support! An additional point I feel must be mentioned here is that at no point was a convincing argument made that the previous syllabi were not working/doing the intended job nor does any current syllabus make a convincing argument supporting that it will be better than its predecessor.

2. Student participation levels

This is an interesting one. I would think that there is little about the current syllabi and assessment processes that would encourage greater participation in mathematics and the physical sciences. The "feminisation" of assessment might encourage greater participation of girls and might discourage boys, but from my discussions with students over my teaching career other factors are more important. The most common reasons students give for choosing the more difficult mathematics and physical sciences are that these subjects are necessary as prerequisites (Maths B and Chemistry being common prerequisites for tertiary entrance), and that "good" performance in these subjects will help improve their OP. If greater

participation is desired the easy option is for universities to make Physics and Maths C perquisites again. As soon as the University of Queensland dropped Maths C from their engineering/science perquisites the other Queensland universities followed and the Maths C enrolments dropped as students felt they didn't need them and logically choose other options.

3. The ability of assessment processes to support valid and reliable judgments of student outcomes.

Let me be blunt here under current QSA procedures valid, reliable and most importantly fair and consistent judgements are impossible. If you seriously think of ways in which you would try to ensure these laudable aims across the width and breadth of Queensland then QSA's processes and procedures can only be assumed to be aimed at producing exactly the opposite result.

Let me count the ways.

First Point: Have a poorly written and vague set of content descriptors. In the 2007 Physics syllabus (lauded as one of "new" "low definition" syllabi – which QSA puts forward as a "good thing"!!!) the content is describe on pages 8-10 under an "Organiser – Key concept – Key idea" model. Basically some general non-specific statements. For depth of teaching there another three pages in Appendix 3. This lists "suggestions for content" and "is not exhaustive". By contrast the 1995 syllabus details the topics to be studies, learning experiences, resources and most importantly the core material to be studies, the minimum depth of treatment of the core and ideas for extension material. This is done on pages 14 – 31. On page 12 were listed the subject matter topics, the time to be allocated to teaching these topics as well as the number of hours to be spent on extension topics – where the school / teacher could extent students in areas most relevant to the school population etc. There is simply no comparison between the two syllabi: Under the 1995 syllabi you could be certain of what Physics a student had been exposed to and to what depth. Students successfully exiting the 1995 syllabus would have a good and detailed foundation in Physics and what that foundation was could be clearly seen in the syllabus. Now since the 2007 syllabus was implemented at best you might have a vague idea of what a student has covered in their Physics class but to what minimum depth and minimum set of the knowledge of Physics who would know? No one! Every school basically does what it likes with a vague general framework. Thus the first problem is the whole content basis of Physics is built on shifting sand.

Second Point:Standards – clearly QSA has had a long standing inability to understand what a standard actually is. I refer to submissions # 28 and #30 for an excellent understanding of this point. The 1995 "standards" as seen on page 35 whilst not the most descriptive at least have three things going for them: they are minimum standards and as such set the boundary from one level to another; they nest, that is VHA encompasses the HA standard and so one down. Now the language used "very high ability", "high ability" etc. are not the best terms to have but in practice percentage cut-offs like 80%, 65%, 45% and 25% were used as most schools to a large extent were "on the same page" with most other schools across the state; finally the three criteria are distinct and separate: basically recall and apply knowledge in simple situations, simple scientific processes and complex reasoning processes. This might sound like jargon BUT on pages 5-7 the expected outcomes are given in at least some detail under general objectives.

In the 2007 the "standards" stated are not minimums but "characteristics" that the student work should have. They do not nest i.e. the first Knowledge and conceptual understanding criterion (KCU1) has "and" at the VHA level and "or" at the HA level, yet the second KCU criterion has "complex" at the VHA and a blank in that spot at the HA level.

The table below from the 2007 syllabus (with QSA highlighting) show the top two standards for the 9 sub criteria.

	Standard A	Standard B
Knowledge and conceptual understanding	The student work has the following characteristics: • reproduction and interpretation of complex and challenging concepts, theories and principles • comparison and explanation of complex concepts, processes and phenomena • linking and application of algorithms, concepts, principles, theories and schema to find solutions in complex and challenging situations.	The student work has the following characteristics: • reproduction and interpretation of complex or challenging concepts, theories and principles • comparison and explanation of concepts processes and phenomena • linking and application of algorithms, concepts, principles, theories and schema to find solutions in complex or challenging situations.
Investigative processes	The student work has the following characteristics: • formulation of justified significant questions/hypotheses which inform effective and efficient design, refinement and management of investigations • assessment of risk, safe selection and adaptation of equipment, and appropriate application of technology to gather, record and process valid data • systematic analysis of primary and secondary data to identify relationships between patterns, trends, errors and anomalies.	The student work has the following characteristics: • formulation of justified questions/hypotheses which inform design and management of investigations • assessment of risk, safe selection of equipment, and appropriate application of technology to gather, record and process data • analysis of primary and secondary data to identify patterns, trends, errors and anomalies.

Evaluating and concluding	The student work has the following characteristics: • analysis and evaluation of complex scientific interrelationships • exploration of scenarios and possible outcomes with justification of conclusions/ recommendations • discriminating selection, use and presentation of scientific data and ideas to make meaning accessible to intended audiences through innovative use of range of formats.	The student work has the following characteristics: • analysis of complex scientific interrelationships • explanation of scenarios and possible outcomes with discussion of conclusions/ recommendations • selection, use and presentation of scientific data and ideas to make meaning accessible to intended audiences in range of formats.

Key: Qualifier

Characteristic of general objective

Most of the key terms highlighted to gauge the difference between levels of achievement are not defined in the syllabus so as to clearly state what these terms are meant to mean with respect to the syllabus. The glossary on pages 38 – 41 gives some definitions. You will find "evaluate" and "justify" but not "discriminating" nor "innovative", "systematic", "effective" or "efficient". Similarly "complex" and "challenging" are not defined – QSA has published something on this since but it clearly states:
"This clarification is not meant to offer a binding definition, nor does it provide the only possible interpretation. It does however offer teachers one definition, around which there has been discussion and consensus among practising teachers (i.e. state review chairs and panellists and district review panel chairs)"
So an opinion that counts? In any case it is not in the syllabus and it took 3 years for the realisation that it was needed. The result of all this is that teachers are forced to make subjective decisions of what these gate post terms mean. For example the EEI presented to the committee by the author of submission #12 (which I note that QSA has now placed on it's website as an "A" sample student response) clearly does not meet "A" level standards: The hypothesis is not specific or significant, the analysis of data is clearly not systematic and I see little discrimination and no innovation in the presentation. That is not to say that it is a poor response – in fact it is quite good but not in my opinion overall "A". This is my opinion and I have every right to interpret the "standards" as I believe they should be. If you want a consistent interpretation then clearly define what is expected, be specific! If not then then inherent inconsistencies and differences of opinion on what "standards" mean will derail any attempt to have a fair and equitable system.

The syllabus specific issue that guarantees unreliability is the non-specific nature of the criteria. They blend into each other: how is KCU1 "reproduction and interpretation of complex and challenging concepts, theories and principles" that different from EC1 "analysis and evaluation of complex scientific interrelationships"? How can you achieve in KCU3 "linking and application of algorithms, concepts, principles, theories and schema to find solutions in complex and challenging situations", without also doing KCU1 "reproduction and interpretation of complex and challenging concepts, theories and principles"?
I know some teacher that think you can and other that say you cannot. Not a recipe for consistency in judgements!

At this point I must turn to the Mathematics syllabi. I'll keep my comment to Mathematics B but they are equally applicable to Mathematics A & C. I'll start with a positive: by comparison to the Physics syllabus content is detailed and learning experiences suggested.

Unfortunately there are numerous problems with this syllabus as well. The first is of course the lack of a minimum standard. We have the same "The student work has the following characteristics" problem. No minimum standard and of course not concept of proficiency. How many times must a "standard" be reached? Once, twice etc? Again "Who knows"? The previous syllabus used term like "consistently" and "generally" to describe student proficiency, and while these terms are open to interpretation most schools were able use this as guide to award levels of achievement. This was removed from the current syllabus without any justification.

I have included below the QSA published "standards" for Mathematics B (Please note the Mathematics B standards as published do not include a Key as the Physics standards do) to point out a number of limitations:

1. They like the Physics standards do not "nest" i.e. the "A" and "B" descriptors for the first dot point in "Knowledge and Procedures" (KPS) are identical.
2. Many descriptors are left blank – no requirement at all?
3. The use of imprecise terminology i.e. "complex" is given a vague definition of p.6 and "routine" is described as "well-rehearsed" on the same page, while "non-routine" requires "insight" and "creativity"- neither of these two terms being defined. "Life related" is left as a subjective matter of opinion. These are a few examples, all three criteria are littered with such subjective terms, thus yet again the use of subjective terms can hardly lead to a fair and consistent approach to assessment: what is for one school/teacher "routine" may, to another be "non-routine".
4. The use of "recall, access, selection of mathematical definitions, rules and procedures in routine and non-routine simple tasks through to routine complex tasks, in life-related and abstract situations" in the first dot point of KPS, gives the impression of multiple achievements required. Another submission shows this as a diagram. This is for one dot point!
5. There is no indication in any syllabi (mathematics, physics or chemistry) as to how the dot points are to be combined. What do you do if a student is not consistent? Of course there is no requirement to achieve in any consistent way!
6. The total lack of actually being required to successfully use mathematics in any descriptor. Students are not explicitly required to have success in mathematics nor are they required to solve problems! Unbelievable.
7. In "Modelling and Problem Solving" (MPS) only the first dot point is actually about problem solving. Most of the other dot points are just "talking" about the mathematics.
8. The whole "Communication and Justification" criterion overlaps with the other two and should never have been setup as a separate criterion. You cannot solve mathematics without setting and communicating this using the rules and procedures of mathematics.

	Standard A	Standard B	Standard C	Standard D	Standard E
Knowledge and procedures	The student work has the following characteristics: • recall, access, selection of mathematical definitions, rules and procedures in routine and non-routine simple tasks through to routine complex tasks, in life-related and abstract situations	The student work has the following characteristics: • recall, access, selection of mathematical definitions, rules and procedures in routine and non-routine simple tasks through to routine complex tasks, in life-related and abstract situations	The student work has the following characteristics: • recall, access, selection of mathematical definitions, rules and procedures in routine, simple life-related or abstract situations	The student work has the following characteristics: • use of stated rules and procedures in simple situations	The student work has the following characteristics: • statements of relevant mathematical facts
	• application of mathematical definitions, rules and procedures in routine and non-routine simple tasks, through to routine complex tasks, in life-related and abstract situations	• application of mathematical definitions, rules and procedures in routine or non-routine simple tasks, through to routine complex tasks, in either life-related or abstract situations	• application of mathematical definitions, rules and procedures in routine, simple life-related or abstract situations		
	• numerical calculations, spatial sense and algebraic facility in routine and non-routine simple tasks through to routine complex tasks, in life-related and abstract situations	• numerical calculations, spatial sense and algebraic facility in routine or non-routine simple tasks, through to routine complex tasks, in either life-related or abstract situations	• numerical calculations, spatial sense and algebraic facility in routine, simple life-related or abstract situations	• numerical sense, spatial sense and/or algebraic facility in routine or simple tasks	
	• appropriate selection and accurate use of technology	• appropriate selection and accurate use of technology	• selection and use of technology	• use of technology	• use of technology

	Standard A	Standard B	Standard C	Standard D	Standard E
Modelling and problem solving	The student work has the following characteristics: • use of problem-solving strategies to interpret, clarify and analyse problems to develop responses from routine simple tasks through to non-routine complex tasks in life-related and abstract situations	The student work has the following characteristics: • use of problem-solving strategies to interpret, clarify and analyse problems to develop responses to routine and non-routine simple tasks through to routine complex tasks in life-related or abstract situations	The student work has the following characteristics: • use of problem-solving strategies to interpret, clarify and develop responses to routine, simple problems in life-related or abstract situations	The student work has the following characteristics: • evidence of simple problem-solving strategies in the context of problems	The student work has the following characteristic: • evidence of simple mathematical procedures
	• identification of assumptions and their associated effects, parameters and/or variables	• identification of assumptions, parameters and/or variables			
	• use of data to synthesise mathematical models and generation of data from mathematical models in simple through to complex situations	• use of data to synthesise mathematical models in simple situations and generation of data from mathematical models in simple through to complex situations	• use of mathematical models to represent routine, simple situations and generate data	• use of given simple mathematical models to generate data	
	• investigation and evaluation of the validity of mathematical arguments including the analysis of results in the context of problems; the strengths and limitations of models, both given and developed	• interpretation of results in the context of simple through to complex problems and mathematical models	• interpretation of results in the context of routine, simple problems		

	Standard A	Standard B	Standard C	Standard D	Standard E
Communication and justification	The student's work has the following characteristics: • appropriate interpretation and use of mathematical terminology, symbols and conventions from simple through to complex and from routine through to non-routine, in life-related and abstract situations	The student's work has the following characteristics: • appropriate interpretation and use of mathematical terminology, symbols and conventions in simple or complex and from routine through to non-routine, in life-related or abstract situations	The student's work has the following characteristics: • appropriate interpretation and use of mathematical terminology, symbols and conventions in simple routine situations	The student's work has the following characteristics: • use of mathematical terminology, symbols or conventions in simple or routine situations	The student's work has the following characteristics: • use of mathematical terminology, symbols or conventions
	• organisation and presentation of information in a variety of representations	• organisation and presentation of information in a variety of representations	• organisation and presentation of information	• presentation of information	• presentation of information
	• analysis and translation of information from one representation to another in life-related and abstract situations from simple through to complex and from routine through to non-routine	• analysis and translation of information from one representation to another in life-related or abstract situations, simple or complex, and from routine through to non-routine	• translation of information from one representation to another in simple routine situations		
	• use of mathematical reasoning to develop coherent, concise and logical sequences within a response from simple through to complex and in life-related and abstract situations using everyday and mathematical language	• use of mathematical reasoning to develop coherent and logical sequences within a response in simple or complex and in life-related or abstract situations using everyday and/or mathematical language	• use of mathematical reasoning to develop sequences within a response in simple routine situations using everyday or mathematical language		
	• coherent, concise and logical justification of procedures, decisions and results	• coherent and logical justification of procedures, decisions and results	• justification of procedures, decisions or results		
	• justification of the reasonableness of results				

Third Point: The review process. The system of district panels as a review mechanism is essentially flawed. The example stated by a supporter of the QSA gives discusses a student moved down by the district panel by a significant amount – 13 rungs, and then moved back up after negotiation with the state panel until the student was 1 rung down from their original position. But panels are told we cannot move students less than one third of a band! (that is about 3 rungs) Yet here we have an example of how to do it. Just move them more than a third of a band and then the school have to fight it out with the state panel!
Panels are not able to do the job they are supposed to do because:

- Syllabi are so vague that essentially school decisions are opaque to all but those in the school. How does the school combine achievement in the various dot points? Between the content areas? Within an exam or other piece of assessment? Since you are the escape sentence on page 32 (Mathematics B syllabus) "When teachers are determining a standard for each criterion, *it is not always necessary* for the student to have met each descriptor for a particular standard; the standard awarded should be informed by how the qualities of the work match the descriptors overall."
  How do you know which one a student didn't meet? You don't.
- The school chooses the folios to send in. It is common practice to send in those that meet the "standard", but it is incredibly easy to hide those that don't. The chances of being subjected to a "random sample" are very low. In the last 15 years my current school has in the 7 science and mathematics subjects offered been random sampled once! In any case random sampling is after the event- it takes place in the year after that cohort of students has left school! Anything not above board has been "got away with"!
- Panellist have 2 hours to know what a school as set for assessment and find "evidence" to "support the school's decisions". I cannot read 5 (monitoring or 9 for verification) " EEI's or ERT's in that time. Yet I am also expected to check that assessment covers all criterion and dot points to the various levels necessary and that the student responses support the decisions made. Under the old syllabi this was just possible (never in the 2 hours – but most panellists that I know volunteer many hours more than this! How many assessment systems rely on the charity of its victims?), but under the current syllabi it is simply not possible! You simply cannot know the students in a school's sample as well as the school and with the use of subjective criteria and dare I say it no marks, it is stupidity to think that it can be done. Note panellists are instructed not to regrade work, no guidelines if you find errors in grading!
- Panellists are forced to use set comments – which limit what advice can be given. In any case a school can ignore most advice since if "we can live with it" it gets through. By the way this is what we are told we have to decide on. If you can't then you have to find specific evidence where the submission is lacking. There is never enough time for that. So unless a submission is a "basket case" there is a lot that gits "lived with".

Some final points:

1. The current system of assessment in Mathematics, Physics and Chemistry is flawed, inefficient and ineffectual unable to fulfil its required purpose.
2. I think that some form of external assessment must be implemented, that can take the place of the current QCS test for the comparison of performance between schools and students. It is nonsensical to use the results of an English essay (the Writing Task part of the QCS test) to compare non-English assessment.
3. School based assessment must be supervised. The over use of written assignments needs to be limited as no matter what procedure is put in place you can never be sure of the ownership of such tasks. I know that many students obtain help from tutors and parents but there is no way I can prove it unless a student copies another student's work directly or they confess.
4. Have content detailed to what must be learnt and to what depth. Be detailed and specific.
5. Set true standards: that nest, are based on distinct and separate criteria, which are specific and detail the level of proficiency required: achievement is not a one off thing! Detail how any sub

criteria are to be combined – this would be best done using marks. Since the QSA quite hypocritically uses marks to determine OP scores when the criteria used in the Short Response Task and Writing Task parts of the QCS test are converted to marks why can't we?

6. Each syllabus must give an explicit mechanism to determine levels of achievement AND the rungs within the level of achievement. Ditto on going from levels of achievement to SAI's (subject achievement indicators – the basic input to the OP determination process).
7. If we continue with a panel process then the school cannot be allowed to choose the students. Use a process similar to that of the IB system: the school submits predicted grades to the district office and they randomly choose the students from these grades. The school can submit additional students if they believe that a chosen student is "not typical". Note in the IB system the internal assessment is remarked by experienced and trained teachers so at the end of the day students get the results they deserve.
8. Question: If our system was what it is meant to be where a VH5 in one school is the same as a VH5 in another school, why do we need to compare performance using the scaling of the QCS test? The QSA is quite clear there is no weighting of subjects – each subject contributes equally to a student's OP.
9. Question: On the other hand if the QSA values alternative non-exam assessment so much why not replace the QCS test with a couple of essays/assignments/projects? The QSA has suggested procedure for verifying ownership that it believes works – let them use them we are supposed to.
10. Marks are not explicitly banned in the current system but the syllabus writers and those that have approved them have done everything in their power to make the use of marks difficult and problematic. There is not clear case made for this so I assume it is some policy made by people with a number phobia.
11. Question: How can the QSA continue to lay claim to being world's best at… when none else uses this system?
12. Question: If other states use a combination of school based and external assessment why can't we do the same in Queensland?
13. Question: If the Queensland system and the QSA produce such a world class curriculum why do the only academically selective state schools in Queensland (the "Academies") use the IB system? How can we deny the best and brightest the QSA curriculum?
14. I disagree with the statement made by the head of the QSA at the last meeting shown online with respect to assessment types. Most schools in my district do not have 4 supervised assessments(SA). Most only have 2 and one of those is the one after verification that is never seem. I have reviewed a number of schools that have 3 non SA's and one SA (exam) and students consistently achieve their lowest grade on the SA.
15. I will not denigrate the QSA supporters that have made submissions but find your support for the current system incomprehensible.

I could go on and on and I'm sure that some reading this will say that I have already written too much. To the committee I thank you for giving me this opportunity to have my say and earnestly hope a better fairer and more efficient process results from this inquiry. I would also like to thank Dr. Ridd for standing up for what is right and being a "good man prepared to do something".